

# THE IRON AGE

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## Electric Washer Production Methods

Drilling Machine Builder, in Taking Up Side Line, Applies  
Experience in Automobile Production—Single-Purpose  
Machines Used—Conveyors Handle Material

**C**OMBINING experience gained in engineering and production work in the machine tool field and in designing special single-purpose machines for use in the automotive industry, The Foote-Burt Co., Cleveland, has applied both machine-tool practices and automobile production methods to the manufacture of a popular household appliance—an electric washing machine. The manufacturing unit that has been provided for making this machine is interesting because it represents a development in manufacturing processes which can be applied to the making of other products, bettering the product and reducing production costs.

Generally speaking, the company is building a washing machine like a machine tool but manufacturing and assembling it like an automobile. A feature of this manufacturing unit is that the company has also provided a continuous working demonstration of its line of drilling, tapping and boring machines in special types for production work in machining various castings.

When conditions in the machine-tool industry indicated that the demand for machinery might not be sufficient for some time to keep plants fully employed, The Foote-Burt Co. decided to add the manufacture of washing machines to its machine tool products. A company that was making an electric machine of the vacuum-cup type was bought out and the machine was

redesigned along machine tool lines with the view of assuring the greatest length of service. The company turned over one end of its plant or about 25 per cent of its floor space to its washing machine department. This is laid out for machine operations on the cast-iron parts and for assembling. Some small parts, including aluminum die castings, are received in their finished form. The machine has four main cast-iron members that are machined in the plant and three of these require a number of operations.

Using its experience in designing special-purpose machines for various operations in machining automobile castings the company has developed machines for doing similar drilling, tapping and reaming operations on the washing machine. Special fixtures are provided and taken all together the company considers that it has tooled up its machining units to 100 per cent. The production of the unit varies with the size of the working force. With the semi-automatic operations and the efficiency of the single-purpose machines it is stated that the output is approximately one washing machine per day for each man employed.

### Machining Operations Are Progressive

In a general way the routing and assembling methods used in an automobile plant are followed. The machine equipment is arranged in parallel rows across

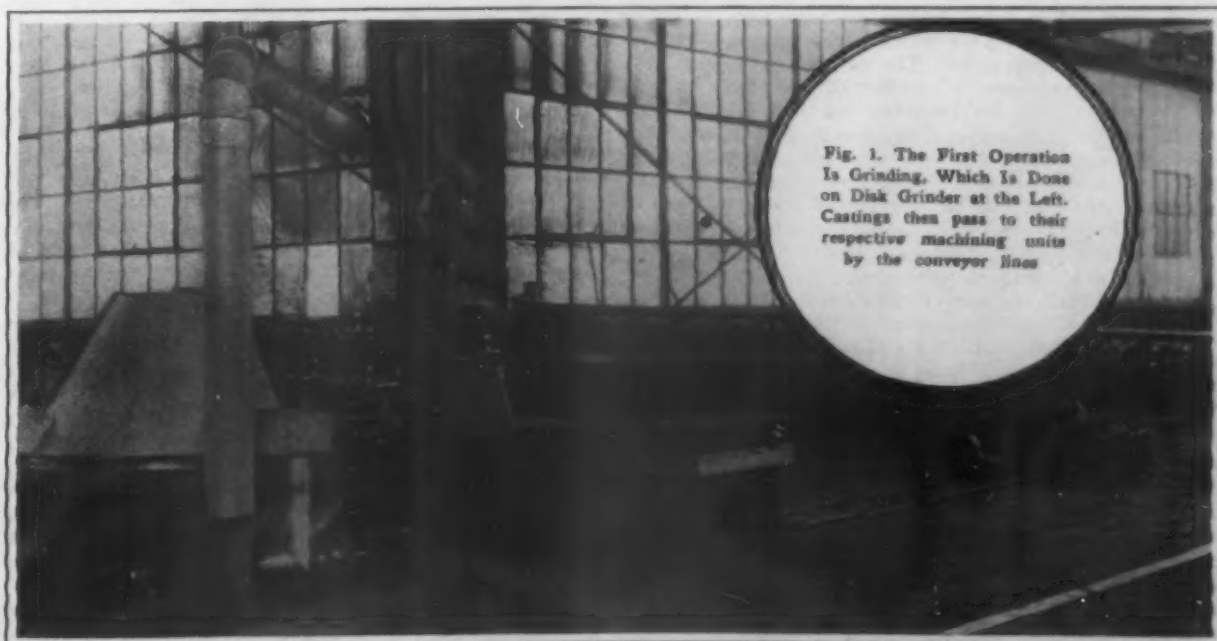


Fig. 1. The First Operation Is Grinding, Which Is Done on Disk Grinder at the Left. Castings then pass to their respective machining units by the conveyor lines

the floor in the sequence of operations so that the casting moves from one machine to the next and when finished is at a point close to the start of the assembly line, which runs at right angles to the rows of production machinery. The machine work is for the most part on the housing casting that incloses the gear mechanism, the housing support, the wringer drive box and the wringer drive box cover. Rough castings go into the receiving department at one side of the plant near the washing-machine unit.

The first operation on all four castings is grinding the flat surfaces, which is done on a Gardner 53-in. continuous disk grinding machine shown at the left in Fig. 1. The revolving reel bearing four work tables, to the slotted faces of which are bolted quick-change fixtures carrying the work, brings the parts to be ground into contact with the horizontal grinding member. A set of four castings is ground with every two revolutions of the machine or at the rate of 28 an hour.

From the grinding machine the four castings are distributed to four separate machining units, one for

eters and three of the horizontal drills have two diameters, permitting the drilling of five holes from the top and seven from the side. The next machine is of a similar type for two-way reaming. This has one vertical and three horizontal spindles, the two in the former reaming two diameters and two of the horizontal tools each reaming two diameters. The next operation, spot facing, is done on a six-spindle machine that has a tumbling fixture for turning the work over. The two final machine operations are done on a 14-spindle and a seven-spindle tapping machine. The finished casting then goes into a cleaning tank in which the oil and dust is washed off and from there to the testing fixture, shown in Fig. 4, in which it is tested for diameter, alinement and depth of holes. These tests require 33 gages, some of which may be seen on the base of the fixture.

Four machines are used for the various operations on the housing support. The first operation is the milling of the top face, which is done on a Brown & Sharpe vertical milling machine. Then the holes are

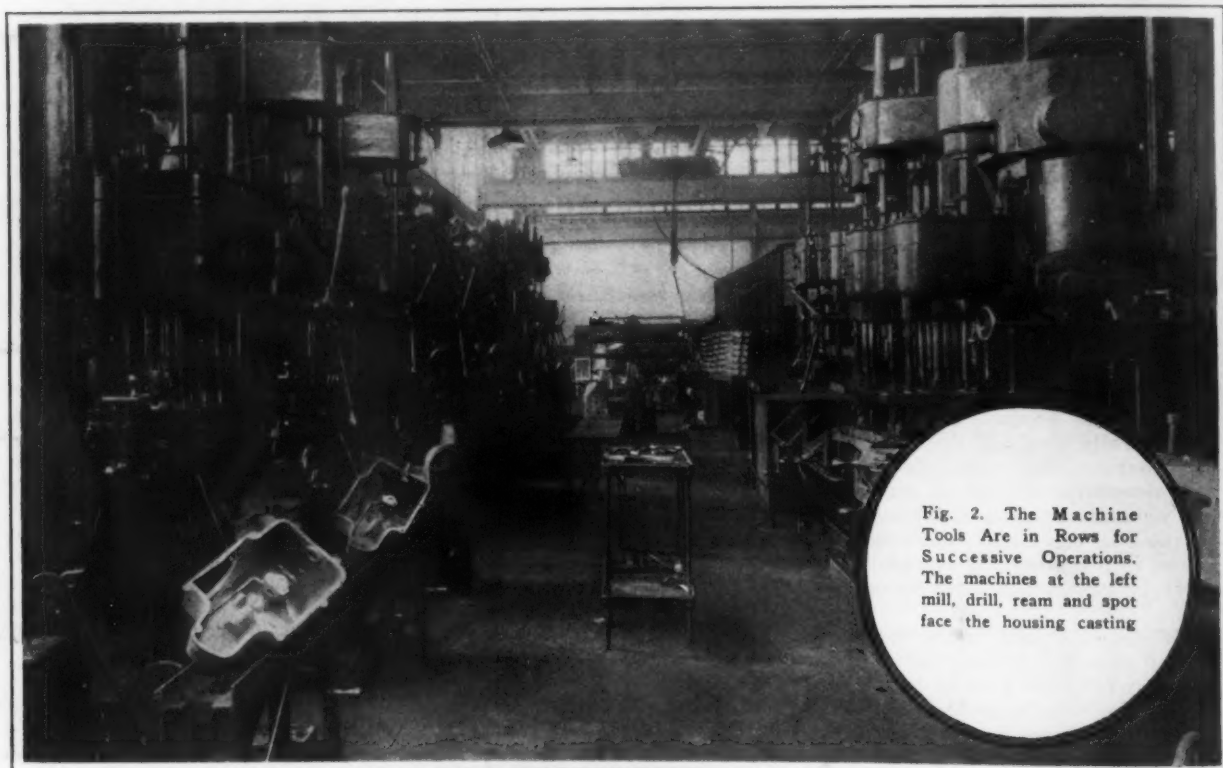


Fig. 2. The Machine Tools Are in Rows for Successive Operations. The machines at the left mill, drill, ream and spot face the housing casting

each part. The three larger castings are placed on gravity roller conveyors which carry them to their respective machining units. The wringer drive box cover, which is a small part, is handled in tote boxes.

Nine machines are provided for the various operations on the housing-casting, one operator attending several machines. The first operation after grinding the top face of the housing-casting is milling the face to which the motor is to be attached. This is done on a horizontal milling machine on the table of which is mounted a motor for the quick return of the table, the quick return being accomplished simply by throwing a switch. The next operation is drilling 16 holes in the top face on a multiple-spindle drilling machine. The casting then passes to a six-spindle reaming machine on which two locating holes are reamed in the face and four holes for bearings. This is followed by simultaneous combination drilling and milling operations on a special machine, shown in Fig. 3. These include drilling five holes on the under side of the housing and at the same time straddle milling four faces on the inside. This machine has two heads. The main head is a fixture that moves down toward the cutters. The drilling head is an auxiliary head carrying five drills.

The next operation is on a semi-automatic two-way drilling machine having four vertical and four horizontal spindles. One of the vertical drills has two diam-

drilled in one operation on a 45-spindle drilling machine. This is followed by reaming 10 holes and spot facing, both operations being done on one machine. The final operation is tapping 35 holes simultaneously on another machine. The part then goes to a cleaning tank.

#### Special Unit for Drilling Wringer Drive Box

An interesting special machine is the three-way drilling machine shown in Fig. 5. This machine has five vertical spindles and horizontal spindles, two on one side and one on the opposite side, for drilling holes in the wringer drive box. Two castings are placed in the fixture and after the first operation the fixture is turned over and the remaining holes are drilled, completing the drilling and at the same time reaming and spot facing a vertical hole. Two holes are reamed in alinement on the next machine and the final operation, tapping, is then done on a seven-spindle vertical tapping machine.

The wringer drive box cover is machined in three operations. First, holes are drilled on a four-spindle machine, then one large hole is reamed on a drill press and this is followed by tapping the holes on a standard tapping machine.

Adjoining the machine units is a crib for tools and stock. Bins are so arranged that workmen on the as-

sembly line can reach from the outside into small bins for parts and an attendant inside sees that the bins are kept filled.

#### Progressive Method Applied Also to Assembly

The washing machine department is arranged for progressive assembling. Various sub-assemblies are added to the housing-support, including the legs and casters, and it is moved along the assembly line until it reaches the housing that is mounted on a cradle for sub-assembly work. The housing and its support are joined and from that point the partially assembled machine moves along the assembly line on its own legs. As it passes along the assembly line the motor and several other parts are added. The wringer drive box is delivered to the assembly line in trays on a gravity roller conveyor. After the trays are unloaded they are placed on a gravity conveyor and go back to the loading point.

#### Conveyors Take Washers to Painting Booths

After the assembly operations noted, the chassis, as it is then called, is spray painted with Duco enamel in a DeVilbiss painting booth. From the painting outfit it is placed on a power conveyor that moves intermittently, automatically stopping after traveling 30 in., covering that distance in 7 min. While moving on the conveyor the chassis is given a test run. At the end of the conveyor the machine passes on to a turntable where some small parts are assembled and it is inspected. If a machine does not pass inspection, it is pushed from the turntable on to a runway at right angles to the conveyor. Beyond the turntable and in a straight line with the first conveyor is another power-driven conveyor along which the chassis is given the second test run and the machine is delivered to a second spray painting booth, shown in Fig. 6, at the end of this conveyor line. In this booth it rests on a turntable that is elevated 30 in. by an air hoist, the machine being raised up for convenience in painting beneath the lower parts.

After the second and final painting the machine is

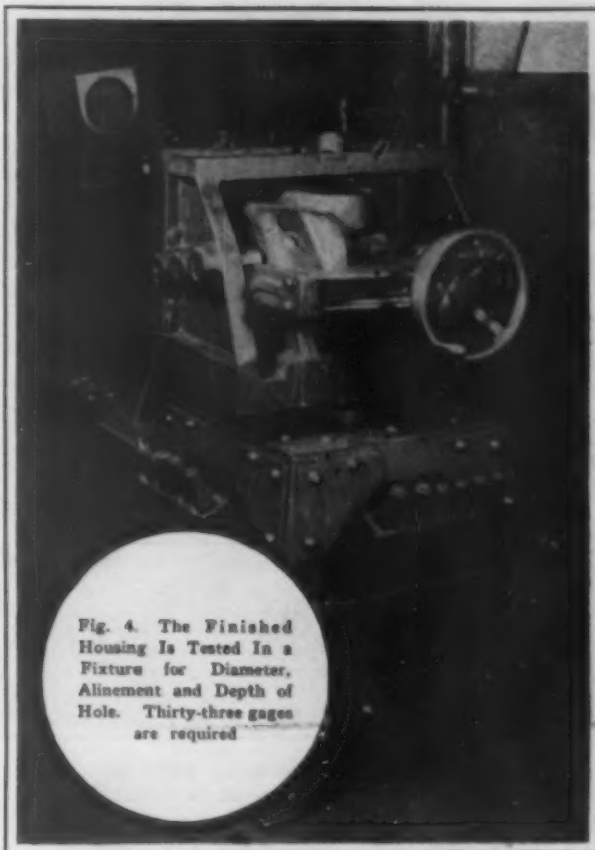


Fig. 4. The Finished Housing Is Tested In a Fixture for Diameter, Alinement and Depth of Hole. Thirty-three gages are required

placed on a channel iron runway, and as it is shoved along this on its casters, the tub, complete wringer assembly and bell assembly are attached, these being the final assembling operations. The machine then goes to a sound proof test booth, where it is operated in a test

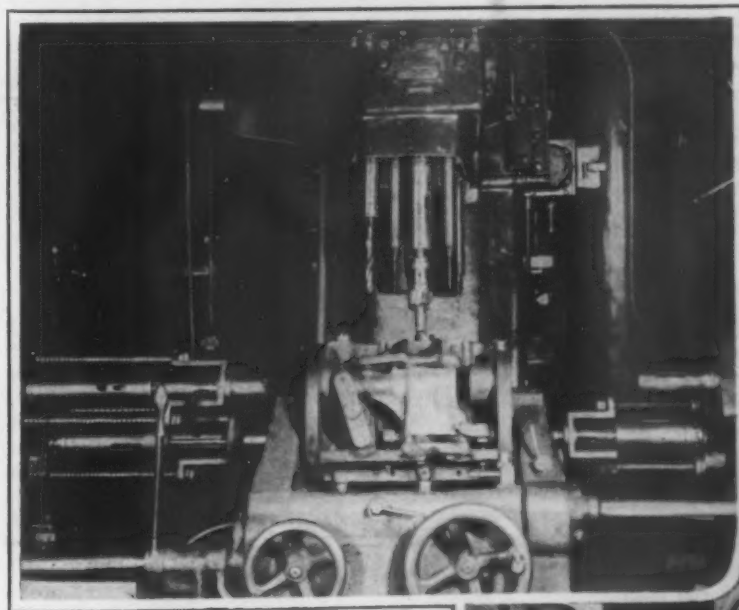


Fig. 3. (Below) Five Holes Are Drilled In Housing Casting and at the Same Time Four Faces Are Straddle Milled In the Special Machine, Part of Which Is Shown. The main head carries the work to the milling cutters and the drills are carried in an auxiliary head

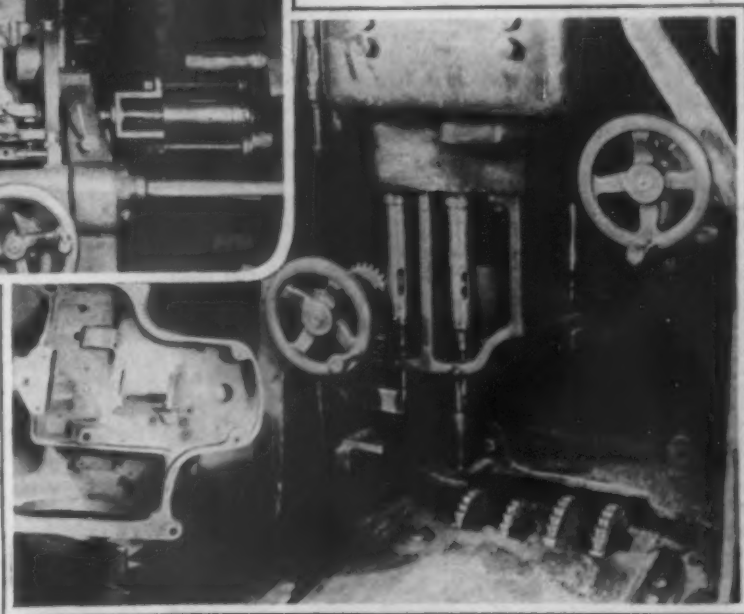


Fig. 5. (above) Three-Way Drilling Machine With Five Vertical Drills and With Horizontal Drills Used in Machining Wringer Drive Box. Two castings are placed in the fixture, which is turned over after the first operation on each part and the remaining holes drilled



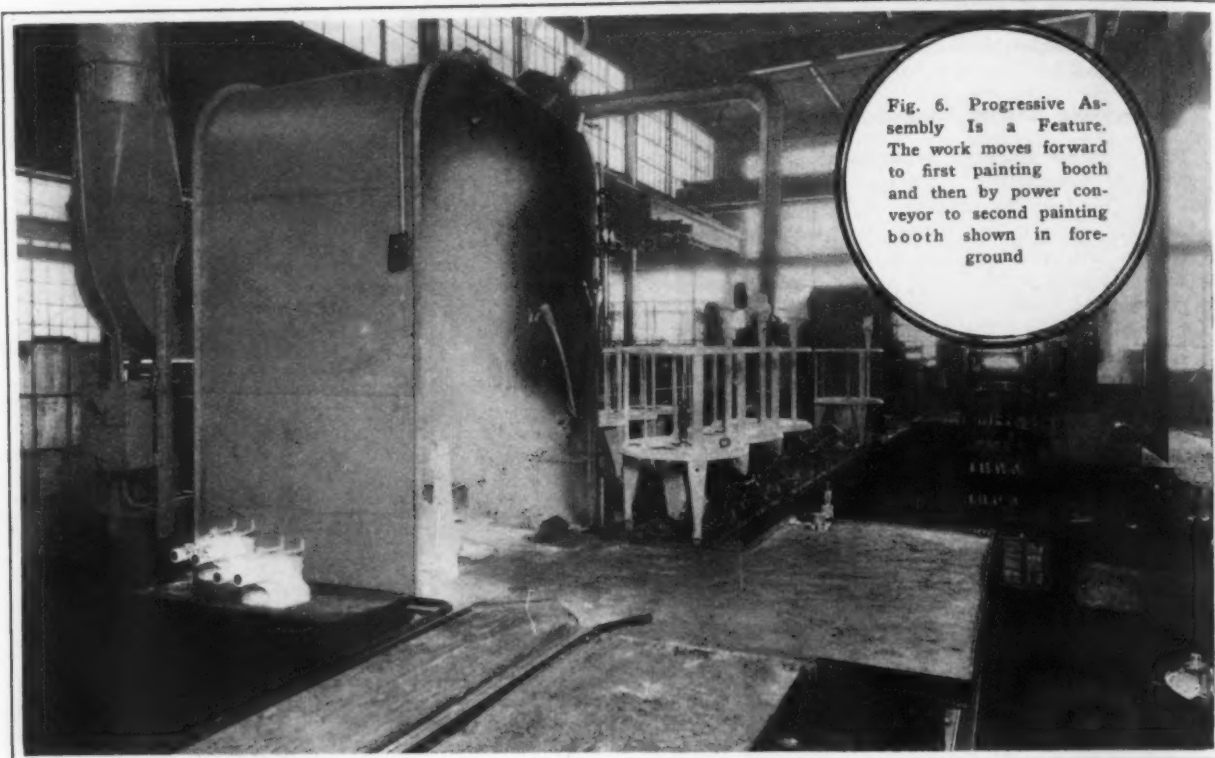


Fig. 6. Progressive Assembly Is a Feature. The work moves forward to first painting booth and then by power conveyor to second painting booth shown in foreground

for noises in the various operating parts and power consumption. From here it goes on to a platform and after the oil is drained out it is shoved on to a truck

platform holding three machines and an elevating platform electric truck conveys the load to the shipping and crating room.

## RATES DISAPPROVED

### Commission in Decision on Brass and Copper Ingots Refers to Jones & Laughlin Case

WASHINGTON, March 17.—Passing upon a complaint of the Duquesne Reduction Co., East Liberty, Pa., the Interstate Commerce Commission last week handed down a decision holding that rates on brass and copper ingots in carloads from East Liberty to various destinations in central and trunk line territories are unreasonable. Reasonable rates were suggested and award of reparation made. It was found that rates to such points as Wheeling, W. Va., Youngstown, and Cleveland, Detroit, Chicago, Louisville, and St. Louis, were unreasonable to the extent that they exceed rates in effect on brass and copper ingots from Williamsport, Pa., to the same destinations and to the extent that they exceed the rates in effect on brass ingots from Falls Creek and Punxsutawney, Pa., to the same destinations. It was further found that the rates to Buffalo, Lakawanna and Depew were unreasonable to the extent that they exceed rates on brass and copper ingots from 60 per cent group points to Rochester.

In the course of the decision, the commission commented on the pending Jones & Laughlin Steel Corporation case, in which iron and steel manufacturers in the Pittsburgh district are seeking to have rates on iron and steel from the Pittsburgh district to Chicago, St. Louis and other points West reduced from the fifth class to the equivalent of the sixth class basis.

In its comment in connection with the Duquesne decision, the commission said:

"Defendants compare the earnings per car-mile under the rates assailed from Pittsburgh to various points in central territory with the rates contemporaneously in effect on iron and steel bars and angles. The average loading used was obtained from a study made in 1920, and was 81,711 lb. on iron and steel bars and 69,825 lb. on iron and steel angles and 69,000 lb. on brass and copper ingots. Iron and steel bars and angles, except for short hauls, move generally under fifth-class rates in central territory. In Jones & Laughlin Steel Corporation v. Baltimore & Ohio et al., docket 15110, the fifth-class basis from the Pittsburgh district on iron and steel articles to St. Louis and points in Illinois and

Indiana is under attack. Brass and copper ingots, in carloads, are rated fifth-class in official and fourth-class in Western classification. The higher car-mile earnings on iron and steel reflect the heavier loading of those commodities as compared with brass and copper. Defendants also compare the car-mile earnings under the rates assailed with the rates contemporaneously in effect from and to the same points on iron and steel billets and pig iron. The average loading used for iron and steel billets was 102,280 lb. and for pig iron 97,532 lb. obtained from the same study hereinbefore referred to. The earnings on billets ranged from 52c. to \$1.39 per car-mile and on pig iron from 45c. to \$1.16 per car-mile, while those on brass and copper ingots range from 48c. to \$2.10 per car-mile. The value of pig iron is about \$21.50 to \$22.50 per ton."

### Semi-Centennial of Chain Power Transmission

Modern chain power transmission had its inception in the little town of Belle Plaine, Iowa, not much more than 50 years ago. William Dana Ewart, of the firm of Ewart & Gore, owners of the town implement store, conceived the idea of a detachable chain link which could be repaired in the field. He believed he was on the right track for the solving of drive troubles, which had cost farmers untold hours of lost time in the field.

All the trials and tribulations a young inventor has to meet were met and overcome by Ewart, with the result that in 1875 the Ewart Mfg. Co. was born. All of this may seem a far cry from the present day problems of power transmission, but it was the beginning, and a part of the romance in back of the convenience and economy of individual silent chain drives, as perfected by the Link-Belt Co., which is this year celebrating the fiftieth anniversary of the founding of the Ewart Mfg. Co., the progenitor of the Link-Belt of today.

"Effect of Stress on the Magnetic Properties of Steel Wire" is the title of a scientific paper of the Bureau of Standards, No. 496, by R. S. Sanford, Bureau of Standards, Washington, D. C. The work described is a part of a more extended investigation of non-destructive methods of testing wire rope.



# Adopt Thirty-Nine Feet as Standard Rail

Railroad Engineers Also Approve Recommended Design for Track Bolts  
and Present Progress Report on General Adoption of Beveled Tie  
Plates—Rail Failures Decline for First Time in Five Years

A RAIL length of 39 ft. was made standard in rail specifications adopted at the twenty-sixth annual convention of the American Railway Engineering Association, held at the Congress Hotel, Chicago, March 10 to 12 inclusive. In stipulating the new rail length, the Committee on Rails stated that many contracts for rails, calling for that length, have been executed during the past year, without entailing a price penalty by the manufacturers. The committee added that the 45-ft. length is the most economical and most desirable, but present average car lengths do not permit ready transportation and mill facilities are not yet afforded for their manufacture. Confidence was expressed that rail mills in future remodeling will provide facilities for the production of 45-ft. lengths.

The new rail specification takes the place of the standard specifications adopted by the society in 1920, which have not been used largely as a basis of contracts because of price penalties imposed by the rail makers. The new specifications embody only well-tried principles and eliminate in general non-essential features which have entailed dissension between rail manufacturers and railroads. The committee also presented a recommended design for track bolts for sizes ranging by sixteenths from  $\frac{1}{4}$ -in. up to and including  $1\frac{1}{4}$ -in. rolled thread diameter. The design is confined to rolled thread bolts, optional properties being presented for the contour of the shoulder, type of thread and periphery of nut. Corresponding joint bar punchings are presented for each type of shoulders.

A progress report of the Committee on Stresses in Track presented the first scientific study of the effect upon rail and upon track maintenance resulting from the canting of rails inward. In concurring with the findings of this special committee, the Rail Committee recommended that rails should be canted inward and that inclined or beveled tie plates should be used to produce the desired cant. That there will be a tendency also to use heavier tie plates was indicated in the report of the Committee on Stresses in Railroad Track. Its remarks on this point were in part as follows: It is of prime importance to have tie plates of adequate length. Increasing the length will not only give increased bearing area, but the greater length will have a beneficial effect by reason of the decreased variation in pressure at the ends of the tie plate corresponding to the variations in the direction of the resultant wheel load under the diverse conditions of traffic. In any case, the thickness of tie plates must be sufficient for the purpose.

## Fewer Rail Failures

Rail failure statistics showing the average failures per 100 track miles per year of service, as reported by the Rail Committee, show the first decline in five years. The record of the performance of the 1918 rolling (the last year for which a complete five-year performance record is available) shows failures of 125.4 as compared with 137 for the 1917 rolling. It seems probable that the 1919 record for the first five-year period will not be quite so good, but it will probably be well below the 1917 peak.

A suggested method for compiling failure statistics through the introduction of a traffic density factor was also presented for consideration. This will involve no additional burdens upon the reporting railroad and will make the relative mill ratings considerably fairer.

For the first time the average weight per yard of rails rolled becomes in excess of the 100-lb section. The average weight of rails rolled by all mills in 1923 was 101.4 lb., as compared with 99.1 lb. for 1922.

A suggested design for substitute ties made of iron or steel or other materials was recommended in a re-

port of the Committee on Ties. The committee recommended that these designs and similar ties be tested under traffic. While no substitute tie can compete with treated wooden ties on an annual cost basis, with the present relative prices for timber and substitute materials, it nevertheless is desirable to have developed the best substitute tie before possible changes in the relation between timber and other material prices might make the substitute tie desirable for extensive adoption. The use of copper content steel for the tie tests was recommended.

Upon recommendation of the Committee on Iron and Steel Structures, the manual of the association was revised to clear up the meaning of "power-driven" rivets. According to the new definition, rivets driven and bucked by pneumatically or electrically operated ham-

Average Failures per 100 Track Miles

Year Rolled	Years' Service				
	0	1	2	3	4
1908	...	...	...	...	298.1
1909	...	...	...	...	224.1
1910	...	...	...	124.0	152.7
1911	...	...	77.9	104.4	133.3
1912	...	38.9	32.1	49.3	78.9
1913	2.0	12.5	25.8	44.8	69.5
1914	1.2	8.2	19.8	32.9	56.9
1915	0.7	8.9	19.0	34.2	53.0
1916	1.6	11.8	29.2	47.7	70.6
1917	5.3	21.6	38.9	66.0	110.5
1918	1.6	8.9	27.6	54.0	92.8
1919	2.0	14.8	39.4	73.7	104.8
1920	3.9	14.2	32.4	63.1	...
1921	1.6	10.9	34.9	...	...
1922	1.5	15.9	...	...	...
1923	3.7	...	...	...	...

mers are considered power-driven rivets. Tests to determine the relative values of punched and reamed work have not proceeded far enough to give conclusive results. They will be continued and the program amplified with a view to supporting a recommendation to abolish or amend the optional clause now in the general specifications for steel railroad bridges.

## Combined Galvanizing and Annealing of Fence Wire

In discussing improved methods of preventing corrosion of fence wire, the Committee on Signs, Fences and crossings called attention to a so-called process of "galvannealing" wire. According to this method, the wire passes from a zinc pan 28 ft. long directly into and through an annealing furnace about 30 ft. long, in which the temperature is kept at approximately 1200 deg., or 325 deg. above the temperature of the zinc bath. Movement of the wire through this furnace is at the rate of 115 ft. per min. A very uniform and comparatively heavy coating is secured on the wire. This wire has not been manufactured long enough for full service tests, but its action under salt spray tests indicates a life about twice that of wire manufactured by the ordinary process. Its action under the Preece or copper sulphate test, which is that specified by the A. R. E. A., indicates a resistance to the standard copper sulphate solution 50 per cent in excess of that of ordinary wire.

Officers of the association elected for the coming year include: President, J. M. R. Fairbairn, chief engineer Canadian Pacific System; first vice-president, C. F. W. Felt, chief engineer Atchison, Topeka & Santa Fe; second vice-president, D. J. Brumley, chief engineer Chicago Terminal Improvements, Illinois Central; treasurer, George H. Bremner, Chicago, Burlington & Quincy; and secretary, E. H. Fritch. The attendance, at 988, compares with the previous record of 987 for last year.

# Oxygen Purity and Cutting Efficiency\*

## Research on the Economies Possible from the Use of High-Purity Gas in Oxyacetylene Cutting of Steel

BY JOHN J. CROWE AND GEORGE L. WALKER

UNTIL a comparatively recent date all oxygen was produced by chemical or electrochemical means and some of the older users of oxyacetylene torches will tell you that the oxygen produced for welding and cutting was very expensive and that it was about as impure as it was expensive, when judged by our present standards. Today most of the oxygen used in oxyacetylene welding and cutting is manufactured by the liquid air process.

The atmospheric air is liquefied by compressing and cooling, and the oxygen is obtained by what amounts to a distillation process. The boiling temperature of oxygen at atmospheric pressure being  $-182.5$  deg. C. ( $-296.5$  deg. Fahr.) whereas the boiling point of nitro-

over a period of several years. It is the results of these experiments which are presented in this paper.

### Test Methods Used

The experiments were made on steel plates and rolled steel billets ranging in thickness from  $\frac{3}{4}$  in. to 12 in. To eliminate the human element or personal equation as far as possible, all the cutting done in the first series was done with a hand torch mounted on a machine (radiograph) geared to give variable speeds from a few inches per minute up to 60 in. or more per min., and in the second test series the cutting was done with a machine torch mounted in the same manner (See Fig. 1).

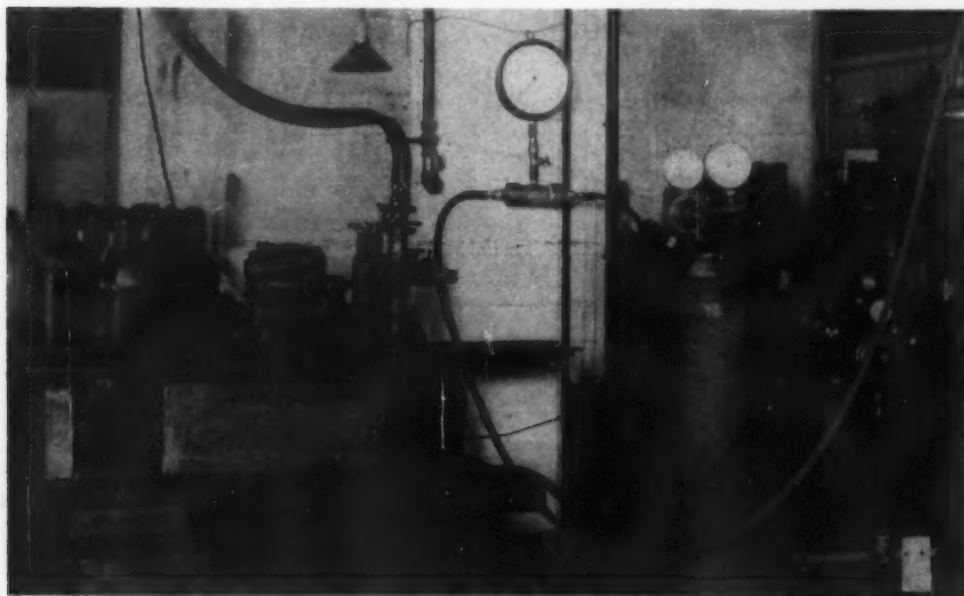


Fig. 1—The Radiograph, Geared to Variable Speeds, Which Was Used in the Cutting Tests

gen is approximately 13 deg. C. lower or  $-196$  deg. C. ( $-320.8$  deg. Fahr.).

Oxygen has many uses, one of the recent applications being its use as an explosive in the liquid state with powdered carbon, but the use with which we are interested in the present discussion is its application to the oxyacetylene process of cutting.

Until quite recently oxygen users were contented with oxygen of 97 to 98.5 per cent purity. By improving the apparatus and operation of liquid air plants it has been found possible to manufacture, commercially, oxygen of much higher purity. By stages the purity of oxygen has been increased until now it is possible to obtain continuously by that method oxygen with a guaranteed purity of 99.5 per cent, plus or minus a tolerance of 0.1 per cent.

The question naturally arises what benefits are to be derived from small increments in purity as we approach the ultimate limit of 100 per cent oxygen. To answer this question the Air Reduction Sales Co. has carried out two series of experiments extending

The speed of the radiograph was checked with a stop watch. The pressures, where practicable, were measured with mercury manometers and the higher pressures were measured with standard test gages, frequently calibrated and tested on a dead weight gage tester. The gas (oxygen and acetylene) consumptions were obtained by weighing the cylinders before and after using, on scales accurate to  $\frac{1}{4}$  oz., and these weights were checked up, making up the loss in weight with shot and then weighing the shot on a separate balance.

All the material was cooled to approximately the same temperature before cutting and, in short, the experiments were carried out under laboratory conditions in which every possible variable was controlled as closely as possible.

The laboratory was furnished with an ample supply of oxygen, varying in purity from 98.5 per cent to 99.5 per cent by steps of approximately  $\frac{1}{4}$  per cent for the first series and from 97.5 per cent to 99.5 per cent by  $\frac{1}{2}$  per cent steps for the second series. The actual purities were determined at the time of manufacture, and were carefully checked in the laboratory.

Previous experiments in which oxygen of various purities manufactured by the electrolytic process com-

\*From a paper presented at the Feb. 16 meeting of the American Welding Society, New York. The authors are engineer in charge and associate engineer, apparatus research and development department, Air Reduction Sales Co., New York. Copyrighted, 1925, by the Air Reduction Sales Co.

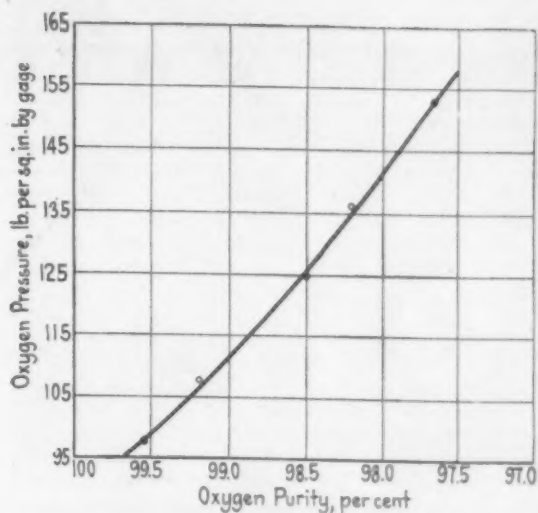


Fig. 2—Pressure Chart in Oxygen Purity Cutting Test on a 12-In. Steel Billet

pared with oxygen of the same purities manufactured by the liquid air process had shown no measurable difference.

#### Results of the Tests

In the graph shown in Fig. 2 the minimum pressures required to cut the 6-in. thicknesses have been plotted against the purity of the oxygen used. [In the original paper Fig. 3 gives a similar curve for the 12-in. billet.] To determine these pressures a large number of preliminary cuts were made on each thickness of metal with oxygen of each purity. The method of procedure followed was to start with a pressure that would make the cut without difficulty, and then to reduce the pressure by stages until the minimum pressure was found that would just make the cut.

Preliminary experiments were also made to determine the most economical size of tip and the speeds to use in making the final cuts. The curves shown are concave upward, but only slightly so, and this is typical of all curves plotted in this manner.

Taking Fig. 2 as an example, it will be noted that the pressure required to cut a billet 12 in. thick, using oxygen of 99.5 per cent purity, was 99 lb. per sq. in., whereas it required a pressure of 112 lb. when the oxygen purity was reduced 0.5 per cent—99.0 per cent—and if the purity was dropped to 98.0 per cent the pressure required was increased to 142 lb. As the cutting tip was the same for all cuts on the same thickness of metal, the oxygen consumption for the same amount of cutting increases with the pressure required to make the cut.

The next series of curves, Figs. 4 and 5 [only the latter is reproduced] show the number of cubic feet of oxygen of the various purities required to cut one linear foot of the metal thickness given on each curve. The consumptions given correspond to the lowest possible pressures it was found possible to use.

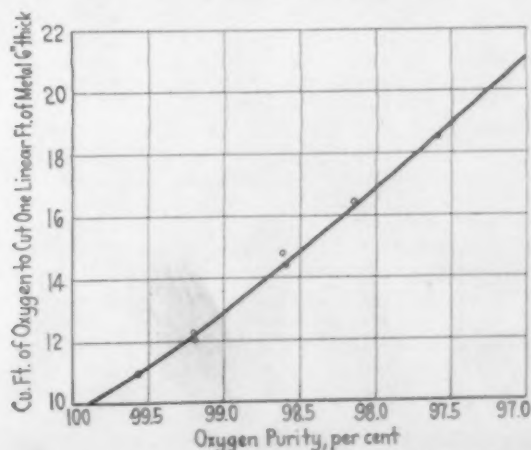


Fig. 5—Oxygen Consumption Chart in Oxygen Purity Cutting Test on a 6-In. Steel Billet

In order that the data obtained may be more easily compared, these have been tabulated in Table I after reducing to a common basis, that is, the number of cubic feet of oxygen of the various purities required to cut metals of the various thicknesses, using 100 cu. ft. of 99.5 per cent oxygen as a standard of comparison. The mean of the results given in the table are shown graphically in Fig. 6.

It will be noted that 11.9 per cent more oxygen of 99.0 per cent purity is required to do the same amount of cutting as was done with oxygen of 99.5 per cent purity, and when the oxygen purity was dropped from 99.5 per cent to 98.5 per cent the increase in consumption was 29.2 per cent. In other words, it required 129.2 cu. ft. of 98.5 per cent oxygen to make the same length of cut as was made with 100 cu. ft. of oxygen having a purity of 99.5 per cent.

The preceding data have shown how the oxygen consumption increases with decrease in oxygen purity

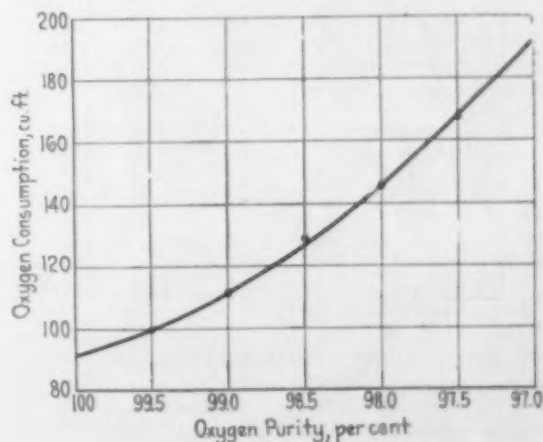


Fig. 6—Average Cubic Feet of Oxygen of Various Purities Required to Cut Metals of Various Thicknesses, Using 100 Cu. Ft. of 99.5 Per Cent Oxygen as a Basis of Comparison

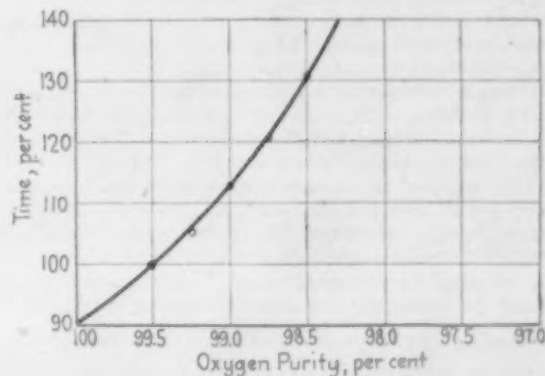


Fig. 7—Time in Per Cent Required to Cut a Given Length Versus Oxygen Purity, Using Oxygen 99.5 Per Cent Pure as a Standard of Comparison

without reference to time. The results of time studies made in the first series of experiments on sizes up to 4% in. thickness are given in Table II. Owing to the large amount of material involved, these experiments were not extended to cover the larger sizes, all the cutting on the 6-in. and 12-in. thicknesses being made at constant speed. The actual time to make the various cuts is shown in Table II and, in order to compare the results, they have all been reduced to a common basis and expressed in percentages using the time obtained with 99.5 per cent purity oxygen as a standard of comparison.

The loss in time, expressed in percentages, very closely approximates the waste in oxygen as the purity decreases, and the two go together, that is, as the oxygen purity decreases the time required to make a given cut goes up as shown in Table II, and the consumption of oxygen in making the cut goes up at the



same time as shown in Table I. The average of the results expressed in percentages as shown in Table II is shown graphically in Fig. 7.

#### Effect of Purity on the Drag

The characteristic drags obtained on the 12-in. billets with oxygen of four different purities are given in Fig. 8. For some work, such as straight line cutting, the amount of drag may not be of serious consequence, but in machine cutting of intricate shapes the drag must be maintained at a minimum, as otherwise the underside of the shape cut will not register with the top side.

To decrease the drag to correspond with that obtained with the high purity oxygen (99.5 per cent), it

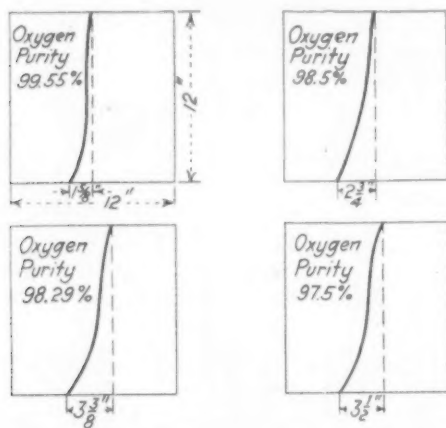


Fig. 8—Typical Cutting Drags for Various Oxygen Purities

would be necessary to increase greatly the pressures and it follows that the consumptions for the lower purities would be much greater than those shown in the curves and tables.

M. Piette, in carrying out an elaborate series of experiments<sup>1</sup> to determine methods of eliminating oxygen waste, selected oxygen having a purity of 96 per cent as representing the lower limit of oxygen purity used in France. The results obtained by M. Piette with oxygen of 96 per cent purity have been plotted in Fig. 9, and the corresponding results obtained by the authors with 99.5 per cent oxygen have also been plotted to the same coordinates. The average of the results shows that it requires 251 cu. ft. of 96 per cent oxygen to do the equivalent work done with 100 cu. ft. of 99.5 per cent oxygen.

The Bureau of Standards, Washington, D. C., as stated in a paper<sup>2</sup> published under date of Dec. 28, 1921, decided to use oxygen of 98.3 per cent purity as best representing the average purity available at

<sup>1</sup> "Eliminating the Oxygen Waste," *Welding Engineer*, vol. 9, No. 12, page 25.

<sup>2</sup> "An Investigation of Oxyacetylene Welding and Cutting Blowpipes, with Special Reference to Their Designs, Safety and Economy in Operation," by Robert S. Johnston, Bureau of Standards Technologic Paper No. 200.

Table I.—Oxygen Consumption of Various Purities Required to Cut Metals of Various Thicknesses, Using 100 Cu. Ft. of 99.5 Per Cent Oxygen as Basis of Comparison

Thickness of Metal, Inches	Series No.	Oxygen Purity				
		99.5 Per Cent, Cu. Ft.	99.0 Per Cent, Cu. Ft.	98.5 Per Cent, Cu. Ft.	98.0 Per Cent, Cu. Ft.	97.5 Per Cent, Cu. Ft.
1/8	1	100.0	114.1	125.5	....	....
1/4	1	100.0	111.1	121.5	....	....
3/8	1	100.0	116.0	140.0	....	....
1/2	1	100.0	115.4	135.0	....	....
5/8	1	100.0	108.0	123.4	....	....
3/4	2	100.0	112.1	127.5	148.8	173.9
7/8	1	100.0	113.3	141.5	....	....
1	1	100.0	108.8	133.6	....	....
1 1/8	1	100.0	114.8	131.7	150.1	169.3
1 1/4	1	100.0	108.4	119.5	....	....
1 1/2	2	100.0	108.9	122.0	139.0	161.0
Average consumption		100.0	111.9	129.2	145.9	168.1
Difference for each 1/2 per cent decrease in oxygen purity			11.9%	17.3%	16.7%	21.5%

that time. The Bureau of Standards found that the range of purity was 97.2 to 99.3 per cent.

#### Some Practical Tests

It was not the purpose of this investigation to enter into any considerable number of practical applications in cutting with high purity oxygen and the results obtained, but anyone interested can easily demonstrate the superior cutting properties of high purity oxygen

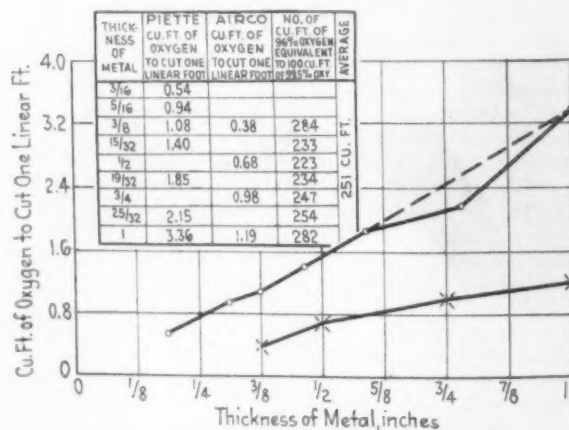


Fig. 9—Comparison of Results With 96 Per Cent Oxygen and 99.5 Per Cent Oxygen. The upper line represents M. Piette's results with 96 per cent gas and the lower line, the results with 99.5 per cent oxygen

by making simple and practical tests, if they will obtain oxygen of, say, 99.5 per cent purity and oxygen of 99.0 per cent purity, or less, and make cuts in the same steel plate or forging with both oxygens.

If the cutting pressures are held equal and constant, it will be found that there will be a very appre-

Table II.—Actual Time Required to Make Cuts of Given Lengths of Metals of Various Thicknesses Using Oxygen of Various Purities and Time Expressed in Percentages, Using Time Required with Oxygen of 99.5 Per Cent Purity as a Standard

Oxygen Purity															
Thickness of Metal, Inches	99.50 Per Cent			99.25 Per Cent			99.00 Per Cent			98.75 Per Cent			98.50 Per Cent		
	Time to Make Cut			Time to Make Cut			Time to Make Cut			Time to Make Cut			Time to Make Cut		
			Per Cent			Per Cent			Per Cent			Per Cent			Per Cent
	Min.	Sec.		Min.	Sec.		Min.	Sec.		Min.	Sec.		Min.	Sec.	
3/16	74	18	100	79	51	107.3	84	45	114.0	91	30	123.1	93	24	125.5
1/4	42	15	100	44	13	102.3	46	54	111.0	48	42	115.2	51	15	121.3
5/16	35	45	100	38	8	106.4	41	27	115.9	48	48	122.5	50	5	140.1
3/8	35	20	100	37	18	105.6	40	45	115.3	43	0	121.7	47	39	135.0
1 1/8	26	7	100	27	4	103.7	28	12	108.0	29	40	113.7	32	14	123.5
1 1/4	14	29	100	15	25	106.5	16	25	113.4	18	32	128.0	20	27	141.3
Mean			100			105.3			112.9			120.7			131.0
Difference for 0.25 per cent in oxygen purity.....				5.3%			7.6%			7.8%			10.3%		
Difference for 0.50 per cent in oxygen purity.....				12.9%						18.1%					

cial difference in the speed of cutting—that is, if the pressures are held equal the length of cut in a given time will be considerably greater for the oxygen having the higher purity. It will also be found that, if the speeds of cutting with both qualities of oxygen are held constant and equal, a much lower pressure can be used with the oxygen having the higher purity, and still maintain the cut. Thereby the consumption is reduced—that is, by holding the speeds the same and properly adjusting the cutting pressures which will be different for each purity, a considerable difference in oxygen consumptions will be shown in favor of the higher purity.

As a field check on the investigation made in the laboratory a large number of oxygen cylinders analyzing 99.5 per cent and an equal number of oxygen cylinders analyzing 99.0 per cent were used for wrecking steel cars, and a careful study was made of the results obtained with the two oxygen purities. Ten cars were scrapped with each purity of oxygen and, to eliminate as far as possible the personal equation, the operators were frequently changed from one oxygen purity to the other, and at no time were the operators informed as to the purity of the oxygen supplied them. Weather conditions were bad, the temperatures ranging

from -30 deg. Fahr. to +21 deg. Fahr., and the cars were covered with snow. Working under these conditions, and with operators some of whom had only a limited experience in oxyacetylene cutting, a saving of 10 per cent was shown in oxygen consumption and 11.2 per cent saving in time, both in favor of the oxygen having a purity of 99.5 per cent.

#### Conclusions

1.—That small increases in oxygen purity greatly increase the efficiency of cutting operations, both as measured by oxygen consumption and by time required to complete a given amount of cutting.

2.—That the difference of effect of small increases in oxygen purity decreases as 100 per cent purity is approached, but the effect is of considerable magnitude for the interval of 99 per cent to 99.5 per cent oxygen purity showing a saving of approximately 12 per cent for oxygen consumption and an equivalent saving in time.

3.—That decreases in consumption and time with small increases in oxygen purity found by the laboratory have been substantiated by practical applications made with oxygen of 99.5 per cent and 99 per cent purity.

## STEEL COMPETITION KEENER

### So Testifies Philadelphia Witness in Bethlehem Merger Hearing

PHILADELPHIA, March 17.—Testifying in the Bethlehem Steel Corporation merger case, Penrose M. Davis, president of the Downingtown Iron Works, Downingtown, Pa., told Attorney B. B. Bane of the Federal Trade Commission that he "assumed" that the Pittsburgh plus practice of selling steel restricts the territory of boiler makers. Mr. Davis said that prices are now quoted on a delivered basis.

"And does that price that is quoted you f.o.b. your plant with freight allowed amount to the Pittsburgh basis at that time plus the Pittsburgh rate of freight?" inquired Mr. Bane.

"Judging from the trade papers, it would," Mr. Davis replied.

When the witness said that he thought the Pittsburgh plus practice restricts the selling territory of boiler makers, he was asked to explain.

"Well, we boiler makers feel that we are paying freight from Pittsburgh into our plant which restricts us in our ability to go west, you might say. In other words, we would be paying freight two ways."

Attorney W. W. Robison for the Bethlehem Steel Corporation objected to a question as to whether the witness could get a wider distribution of his product if he were to pay only the freight rate from point of shipment. Mr. Robison claimed the question omitted the "important and obvious element" of price at which the steel is bought. Mr. Bane reworded his question and asked the witness in effect if he could get a wider distribution of his product if able to save the difference in freight rate from Pittsburgh to his plant and the freight rate from the point of shipment. Mr. Robison said he would concede that the answer would be in the affirmative. Mr. Davis said the first question is answered from a boiler manufacturer's standpoint, but is not a fair question to a manufacturer of steel because steel cannot be manufactured in eastern United States as cheaply as it can be manufactured in Pittsburgh or in that community. Mr. Bane by his questioning of Mr. Davis on this point attempted to develop actual costs figures applying to eastern and Pittsburgh producers, but none was stated. Mr. Davis testified that, except for the Midvale Steel & Ordnance Co., his organization buys from the same steel makers now as it did before the Bethlehem-Midvale-Lackawanna merger.

Sidney G. Matthews of S. G. Matthews & Co., fabricators, Philadelphia, said he bought from various companies, among them Bethlehem and some of the units

it acquired, before the merger, and still buys from Bethlehem along with other makers. He also said that Bethlehem always quoted his company on a basis of freight allowed to destination. He declared that at different periods there had been variances in prices of the same kind of steel at the same time. The witness told Attorney Frederick H. Wood for the Bethlehem Steel Corporation that competition in the steel business is keener today than formerly.

Edward Lawrence Davis, president and treasurer of Davis Bros., Inc., Nicetown, Pa., manufacturer of railroad, boat, mine, wharf and deck spikes and iron and steel bars, said that purchases are made from a number of producers, including Bethlehem, the Alan Wood Iron & Steel Co., and the Pittsburgh Crucible Steel Co.

Howard R. Yearsley, secretary and purchasing agent of the Westmoreland Coal Co., Philadelphia, said his company buys light rails, plates and shapes, and testified as to the different sources of purchases, among them the Bethlehem Steel Co. Prior to the merger, steel bars were purchased chiefly from the Cambria Steel Co. by S. L. Allen & Co., Philadelphia, makers of agricultural implements, but since the merger most of them are bought from Bethlehem, according to Walter South, purchasing agent. Samuel P. Howe, president of the Camden Forge Co., Camden, N. J., maker of iron and steel forgings, said his company ordinarily buys about 15,000 tons of steel each year, divided approximately equally between ingots and billets, and he was of the impression that some ingots had been bought of Bethlehem prior to the merger. Since the acquisition, he said, purchases of ingots had been made from the Birdsboro Steel Foundry & Machine Co., Erie Forge Co., and he thought the Drain Steel Co. also. Billets also are bought from a number of makers, the witness said, but only a small quantity had been bought from Bethlehem, either before or since the merger.

Dr. Carl Benedicks, Director of the Metallographic Institute, Stockholm, Sweden, delivered two addresses in Cleveland, March 16. The afternoon meeting was held under the auspices of the American Institute of Mining and Metallurgical Engineers, when he spoke on "The Nature of High-Speed Steel." At the evening meeting held under the auspices of the Cleveland chapter of the American Society for Steel Treating he talked on "Metallurgy."

The American Gear Manufacturers' Association will hold its ninth annual meeting at the William Penn Hotel, Pittsburgh, May 6 to 9, inclusive.



# Control Chart for the Chief Executive

*THE modern general no longer gallops about the field issuing orders based on his own observation and verbal reports from his aides. He sits at a desk watching carefully prepared maps which show the terrain and every movement of troops and supplies.*

*So the modern executive sits at his desk, watching a few lines on a control chart such as described in this article, noting each change in the rate of movement of his forces and issuing the direction needed to keep them under control.*

BY WALLACE CLARK\*

THE purpose of reports should always be to serve as a basis for executive action. Since responsibility for the formulation and execution of policies in regard to the conduct of a business rests upon the chief executive, he cannot allow his decisions to be based on general impressions or the opinions of members of his staff.

When business organizations were small, an executive could base his control on facts secured from verbal reports. As industry expanded he found it impossible to keep informed as to everything that happened in connection with his business and he therefore had this information condensed and presented to him on written reports. However, the figures on these reports stood alone and there was no standard of comparison to show whether or not they were satisfactory and they therefore did not indicate where action should be taken.

In his attempt to secure some basis for action, the executive had these figures compared with some other period—the previous month or the same month of the previous year. This was obviously a step in the right direction, but it was only moderately effective, because the executive had to remember whether the period used for comparison had been normal and, if not, how far it had been from the norm.

Because this comparison was not dependable, reports frequently failed to indicate action until it was too late. This resulted in the drawing up of additional reports in the hope that if one failed to indicate a dangerous tendency the executive would note it on some other report. The confusion resulting from these overlapping and inadequate reports, combined with the entrance of industry into an era of smaller margins of profit, has necessitated a more dependable method of control.

## More Dependable Method of Control Developed

The distinguishing feature of the method developed to meet this situation is that reports make it immediately apparent that a certain figure is satisfactory or unsatisfactory by comparing it with a plan or a standard. The executive decides in advance what conditions or programs he will consider satisfactory and secures reports at regular intervals which compare actual conditions with those he has predetermined. He is thus left free to concentrate his attention on two things: (1) The cause of variation from the predetermined condition; (2) The action to be taken to bring conditions in line with his plan.

This has been a long step toward simplifying management and it has been applied to almost every phase of production and distribution as well as to transportation and governmental activities. The chief executive has welcomed this method and now has available reports which are definite and dependable. This new method has made it possible to discontinue these reports which overlapped or duplicated information. On the other hand, the fact that the new type of report is effective has stimulated its use and it has been applied to activities which were heretofore considered impossible to cover by reports. In sales organizations consisting of hundreds of men and plants employing thousands of workmen the daily performance of individuals is now being charted against standards or quotas.

But modern business is extremely complex and

when all of its phases are adequately covered by reports the result is so voluminous that it is physically impossible for one man to read all of them, to say nothing of acting on the information they contain. The chief executive has, therefore, delegated to the members of his staff the task of interpreting these reports and taking the action they indicate. However, when this has been done he is face to face with another dilemma; he must see that the responsibilities he has delegated are properly executed and he has no information as to progress except what he can get from additional copies of the various reports he has turned over to his staff.

It is well known that an executive often formulates his most important policies when he is away from his desk. He then has an opportunity to turn the matter over in his mind, to weigh objections against advantages and to reach an unhurried decision upon the course to be pursued. But an executive should not have to get away from his desk in order to think clearly. He must be freed from detail and have presented to him in the briefest possible form only the necessary facts on which to base his decisions and to enable him to apply the judgment and experience which have caused him to be singled out for the position of leadership in his organization.

## Chart Frees Executive of Detail and Permits of Concentration on Control

The operating control chart illustrated has been developed to clear the chief executive's desk and mind of detail so that he can concentrate his attention on the control of his organization as a whole.

The information which has been entered on this chart obviously applies only to the company for which it was drawn up, but the method may be adapted to any business or organization.

The chief executive of this company wished to keep in touch, first of all, with those things which affect the attitude of customers toward his company; that is, the quality of his product and the service rendered. He also wanted to be informed as to the work ahead of his plant, the orders received month by month, data concerned with the operation of the business, such as costs, expenses, idleness and inventories, and, finally, regarding employees—accidents, labor turnover, average earnings and individual production.

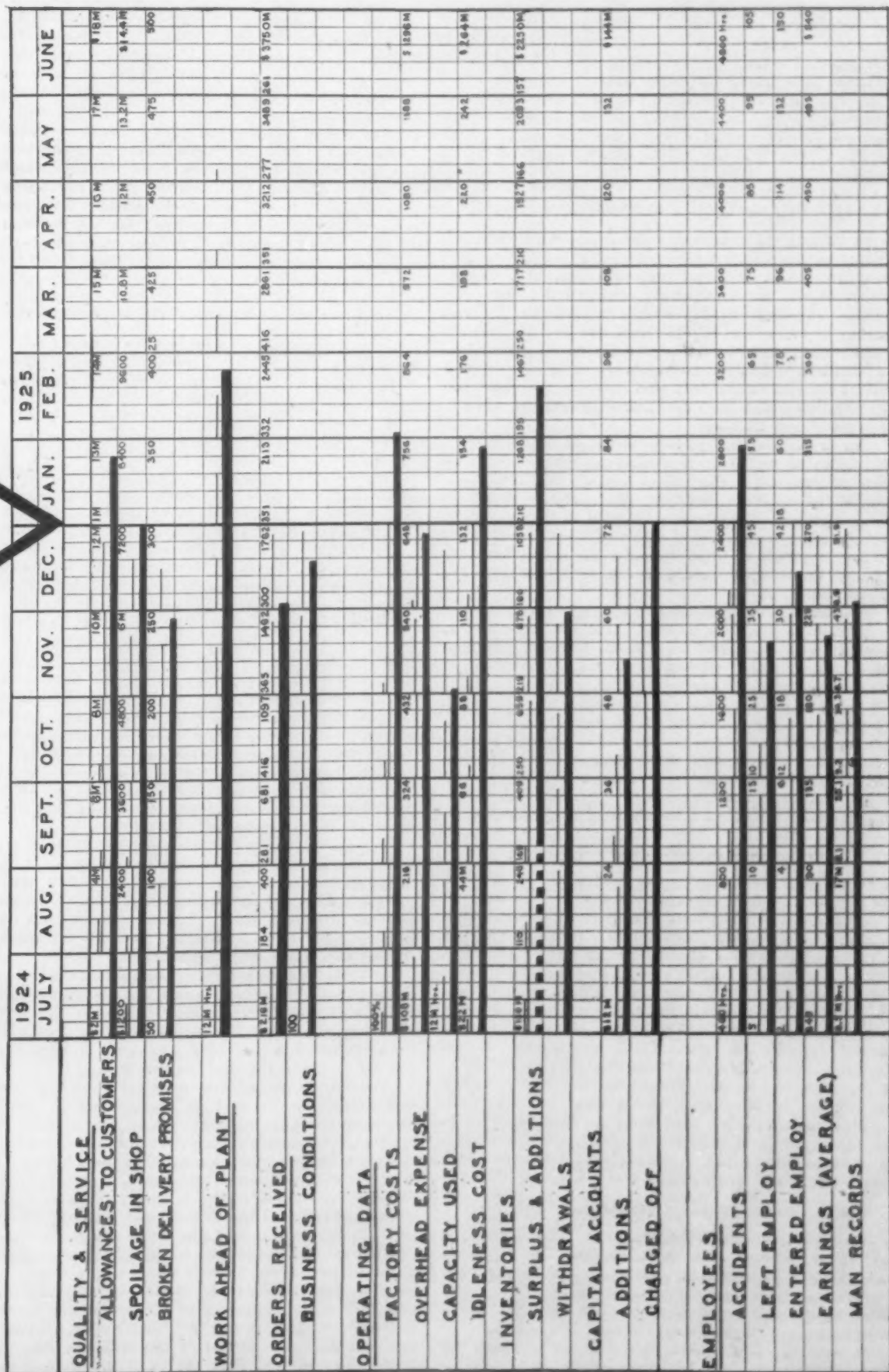
Schedules or standards were therefore developed for all of these activities and the actual performance was charted against these standards. This indicated automatically whether or not progress was satisfactory. If the performance was reasonably close to the plan, the executive knew that there was nothing to worry about and he could safely dismiss the matter from his mind. If, however, the actual performance had fallen below the standard, he asked the member of his staff to whom he had delegated responsibility for that part of the work to bring him reports which went into further detail. They discussed the causes of the unsatisfactory condition and the action which should be taken to correct it. On the other hand, if the actual progress had been considerably better than the schedule, the chief executive complimented his staff and discussed the steps to be taken in order to speed up other activities to keep pace with the one ahead of schedule.

In this way the time of the chief executive was con-

\*Consulting management engineer, New York.



OPERATING CONTROL CHART



THIS Chart Was Prepared for the Chief Executive of a Manufacturing Company. The figures at left of monthly columns represent the schedule, quota or standard for the month, while those at right indicate the cumulative schedule. Light lines compare actual performance with the quota for the month. Heavy lines show actual performance to date. The "v" at top of sheet is not part of the chart—it merely indicates that the chart was photographed after the December records had been entered. The heavy lines which project to right of "v" have exceeded their quotas, while those which end to the left have fallen short of schedule.

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SANTY PROGRESS CHART

served and his work made more effective, because his attention was directed to those things which were most in need of his knowledge and experience.

This control chart, it will be noted, covers a period of one year divided into months. The figures at the left of a monthly space represent the schedule, quota or standard for the month, while the figures at the right show the cumulative schedule. The light lines represent the actual performance charted on the scale of the schedule for that month. The heavy lines show the cumulative performance. The "V" at the top of the sheet indicates that this chart was photographed immediately after the December records had been entered. If a heavy line ends directly under the "V," it is clear that that particular activity has proceeded according to schedule or that the standard has been attained. If the end of a heavy line is to the right or the left of the "V," the activity has exceeded or fallen short of the standard.

#### Check Kept on Quality of Product and Service

In looking for some quantitative measure of the quality of his product, the executive for whom this chart was prepared found that the allowances to customers due to defective goods provided the best indication. He decided that if the allowances did not amount to more than \$2,000 per month for the first six months and \$1,000 for the second six months, the quality situation would be satisfactory. The chart shows that at the end of the first half year the standard had been exceeded and that this had happened in August, September and October.

The losses due to spoilage in the shop approached the matter of quality from a different angle. The light lines on the chart show that during the first three months the spoilage had been considerably in excess of the limit set. When this was noted at the end of the first month, better training facilities were provided for workmen, which resulted in such rapid improvement that by the end of December the total spoilage was within the schedule.

The service rendered by a company to its customers is difficult to measure, but at least an indication is secured by a statement of broken delivery promises. The chief executive wished to build up a reputation for making good on every promise, because he knew what a valuable asset such a reputation is. The chart indicates that the allowance of 50 broken promises per month had been bettered. The executive took advantage of this opportunity to congratulate his superintendent on his success in reducing the number of broken promises and they agreed that for the following year they would set a standard of 25 per month.

#### Work Ahead of Plant Definitely Known

In making his plans for the future one of the first things this executive wanted to know was the amount of work ahead of his plant. He had three shops, each turning out a varied product, so that a quantity of goods as an indication of work ahead was of no value. However, a per cent of the capacity of his plant which was covered by orders gave him definite information. The total capacity of his three shops was 12,000 machine hours per month. The chart shows that on the first of January 60 per cent of the capacity of the plant for that month was covered by orders, in February 50 per cent, and so on. These orders could be turned out only on certain types of machines and therefore could not be completed until May, but a comparison of the total work ahead with the total capacity was shown by a heavy line which indicated that there was less than two months' work ahead.

#### Sales Quotas Compared with Orders Received

At the beginning of the season the chief executive had set his quota of sales at \$3,750,000. This total had been split up into monthly quotas in accordance with the seasonal variation of previous years. The chart indicates that at the end of six months the total orders received were almost a month behind the quota.

In working with quotas during previous years the chief executive had been confronted with one exasperat-

ing difficulty. When he asked his sales manager to explain why the volume of orders received was less than the quota, he usually received the reply that business conditions during the period were not so good as had been expected when the quotas were set. On the other hand, if sales had exceeded the quota, the sales manager had never attributed his success to good business conditions. The chief executive was irritated, not by the attitude of the sales manager, but by the uncertainty in his own mind as to what proportion of success or failure was due to business conditions and what was due to sales policies. He wanted the influence of general business conditions made clear so that the comparison of orders received with quotas would accurately reflect the efficacy of sales policies and their execution.

The chart shows that actual business conditions turned out to be close to the forecast during the first few months, but later had not come up to expectations, so that at the end of six months general business was almost half a month behind the quota. This made it clear to the chief executive that half of his shortage of sales might be ascribed to business conditions, but that some other reason would have to be found for the remainder of the falling off.

#### Costs and Other Operating Data Charted

Under operating data there were grouped six of the most important matters connected with the operation of his plant, with which the chief executive wished to keep in touch. The first was factory costs. The operations on the various products of the plant had been studied and standard costs developed. The chart indicated that at the end of December the cost of the work put through the plant had exceeded the standards by about 12 per cent. The light lines, however, showed that the costs had been lowered month by month and that in December they had been inside the standard.

In arriving at these standard costs the overhead expenses had necessarily been predetermined and obviously the executive wanted to know whether or not the actual expenses were kept in line with the budgeted amounts. The chart shows that the actual expenditures were within the budgets, which indicates that the machine rates in use were approximately correct; that is, the predetermined expenses which had been charged by means of machine rates into the cost of the product or into idleness accounts were close to the actual expenses. If the cumulative line had been shorter, it would have indicated that the machine rates had been too high and the value of the inventory inflated. If the line had been longer, it would have meant that the predetermined rates had been too low and that the cost figures in use did not cover the entire cost.

At the beginning of the season the chief executive knew that he would not be able to run his plant at full capacity, but he wanted to keep before him throughout the year a record showing what part of the plant's capacity had been used. The chart shows that during the first half of the year he had been able to make use of only two-thirds of its capacity.

In order to keep before him the actual cost of maintaining part of the plant in idleness the chief executive set a limit of \$22,000 per month to cover this idleness cost, but the chart shows that he was not able to keep within this limit and had gone almost \$20,000 beyond it during the first six months.

The inventories of raw materials, work in process and finished goods were in the opinion of the chief executive too high in proportion to the probable sales. He therefore aimed to turn over the investment in inventories twice a year, hoping that the following year it could be turned over three times. Instead of charting the total value of the inventory against a predetermined amount it was found better to chart the additions to inventories and the withdrawals in order to find out to what extent the additions should be speeded up or slowed down.

The chart indicates by means of a heavy broken line that at the beginning of the season the inventory had exceeded the six months' turnover by a little over two months. At the end of the half year the cumulative lines showed that the additions were a month



and a half ahead of schedule and withdrawals a little more than a month behind, the net result being a larger inventory than at the beginning of the period.

The company's investments in land, buildings, machinery and equipment, which for the sake of brevity were referred to as capital accounts, were watched by the chief executive to see that they did not grow too large for the volume of business and, on the other hand, to see that enough money was spent to keep the buildings and equipment in first-class condition. During this season in which he did not expect capacity business, the executive planned to buy no more equipment, but merely to keep his present buildings and equipment in good condition. He therefore made the budget for additions equal to the depreciation to be charged off.

The chart shows that at the end of six months \$20,000 less had been spent for additions than had been charged off. At a first glance this would appear to indicate poor judgment, for in spite of the fact that the inventory had been too high at the beginning of the period, it had been increased, while the buildings and equipment had not been properly kept up. However, this had been done by the chief executive deliberately and with full knowledge of the facts. In order to avoid laying off old employees, and possibly losing some of the most faithful and skillful workmen, he had decided to manufacture for stock during the first three months until the volume of orders should so far increase as to keep his working force busy. The result was, of course, a higher inventory, but it was considered wise to take some money out of capital accounts in order to avoid laying off old employees.

#### Information Relating to Employees Included

There were a few facts in regard to employees on which the chief executive was particularly anxious to keep informed. He did not regard industrial accidents as necessary evils and felt that he had no right to place his employees in dangerous positions even if they were willing to run risks for the sake of wages. He had initiated safety-first campaigns, had guards and safety devices attached to machines and had taken every possible precaution against accidents, but he knew that foremen and supervisors were likely to become discouraged when workmen did not take advantage of the accident prevention devices. Accordingly, he had reported to him each month the time lost due to accidents so that he could observe any tendency toward negligence. The chart shows that the limit of 400 hours lost per month has been exceeded, but the executive believes that the steps he has recently taken will considerably improve the situation.

The chief executive knows that one of the strong desires of employees is for steady jobs and he has therefore done much to reduce his labor turnover. He has smoothed out the peaks and valleys of production

in order to provide steady work and has maintained a good training service in order to enable his workmen to earn good wages. The chart shows that the number leaving and entering the employ of the company had both been below the limit set.

This chief executive had, of course, learned years ago that high wages coupled with good training and management help to reduce costs and he therefore aimed to bring up the average weekly wages of the direct workers in his factory to \$45 per week.

The chart shows that the actual wages fell about 20 per cent short of this ideal, due principally to the fact that during the first few months there was not enough work to do. Conditions are better now and it is probable that by the end of the second half year the \$45 mark will be reached.

The chief executive did not believe that it is inherent in the nature of a workman to soldier, but that he will do a fair day's work if conditions are right. Accordingly he had a daily record kept of the production of each workman compared with a definite standard, showing the reason why whenever the performance had fallen below the schedule. He has found that a majority of these delays can be avoided by good management and he has therefore come to regard the summary of these man-record charts as a fairly accurate indication of the worth of his supervisory organization.

#### Executive Harnesses Cooperative Instincts of His Organization for Mutual Good

The analogy between the modern executive and the general or commander-in-chief is an old one, and it is true up to a certain point. Both have their objectives clearly fixed, they marshal their forces for campaigns and coordinate the energies of those under their control. The old methods have passed and the modern general no longer gallops about the field issuing orders based on his own observation and verbal reports from his aides. He sits at a desk watching carefully prepared maps which show the terrain and every movement of troops and supplies. So the modern executive sits at his desk, watching a few lines on his control charts, noting each change in the rate of movement of his forces and issuing the directions needed to keep them under control.

There, however, the analogy ends, for the aim of war is destruction, while the executive in industry uses all his knowledge and skill in harnessing the cooperative instincts of his organization for the mutual good of owners, employees and the public.

It has often been said that the quality which distinguishes an American business man is his practical idealism. On such an operating control chart as this he sets down his attainable ideals and then concentrates his attention on their achievement.

#### Fellowships in Mining and Metallurgical Research

WASHINGTON, March 17.—In cooperation with the Bureau of Mines, Department of the Interior, graduate fellowships in mining, metallurgical and chemical research are offered by prominent institutions of learning in various States. The object in offering these fellowships, according to a statement issued by the Bureau of Mines, is to assist in the solution of problems being studied by the bureau that are of particular importance to the region in which these institutions are situated.

The following-named institutions offer such fellowships for the college year, 1925-1926:

University of Alabama, Tuscaloosa.  
University of Arizona, Tucson.  
Carnegie Institute of Technology, Pittsburgh.  
University of Missouri, Rolla.  
Ohio State University, Columbus.  
University of Utah, Salt Lake City.  
University of Washington, Seattle.  
University of Idaho, Moscow, Idaho.

The School of Mines of the College of Engineering, University of Alabama, offers five fellowships in min-

ing and metallurgical research. The value of each fellowship is \$540 per year. The problems selected for investigation relate to beneficiation of iron ores and include the following phases: Gravity concentration by means of screens, classifiers, jigs, tables, log washers, etc.; reduction of iron ores by means of roasting furnaces; magnetic concentration; sintering of fine iron ore concentrates.

The School of Mines and Metallurgy of the University of Missouri offers four fellowships, the income of which is \$800 each per annum. The subjects to be investigated are the metallurgy of zinc; refractories for the metallurgy of zinc; and physical metallurgy, including the heat treatment of steel.

Detailed information in regard to the terms of these various fellowships may be obtained from the Department of the Interior, Bureau of Mines, Washington, or from the different institutions named.

The sales of electric trucks in Chicago during the past year, 1924, were practically equal to the sales of the two previous years combined, and showed an increase of 62 per cent over the sales of 1923, according to the National Electric Light Association.



## HEAT TREATMENT OF CAST IRON

### Pioneer Work at Holt Mfg. Co. Described Before Chicago Chapter of the Steel Treaters

The results of pioneer research in the heat treatment of cast iron were presented in a paper by Fred Grotts, metallurgical and inspection engineer Holt Mfg. Co., Peoria, Ill., at a meeting of the Chicago chapter of the American Society for Steel Treating, held at the City Club, Chicago, Thursday evening, March 12. Owing to the unavoidable absence of the author, the paper was read by M. L. Frey, metallurgist Holt Mfg. Co., and collaborator with Mr. Grotts in the experiments.

The investigation has progressed far enough to warrant the following conclusions:

- 1.—Hard spots due to combined carbon can be removed by heating to 1750 deg. Fahr.
- 2.—There is a certain application for hardening and drawing cast iron.
- 3.—Cast iron to which steel has been added has increased tensile strength.
- 4.—Alloy cast iron is a field to be developed.
- 5.—Chilled iron can be softened, then rehardened.
- 6.—White iron can be quickly graphitized by heating to 1750 deg. Fahr., then quenching and drawing.

#### Hardening or Softening

In an experiment with a soft gray iron analyzing 3.50 per cent carbon, 0.35 per cent manganese, 0.11 per cent sulphur, 0.45 per cent phosphorus, and 2.75 to 3 per cent silicon, it was found that by quenching at a temperature of 1550 deg. Fahr., a noticeable increase in hardness could be observed. In fact, an average of 50 scleroscope has been obtained in treating a large number of cylinder heads. It is to be noted in this connection, however, that, when a scleroscope of 50 to 60 is obtained, it is customary to draw back the hardness to 35 to 45. Some care is necessary in treating intricate shapes, as quenching cracks are sometimes caused by too rapid and complete quenching.

When a manufacturing program does not permit time for proper seasoning of castings, heat treatment may be used to advantage. Ordinarily when gray iron castings, such as cylinders and pistons, are taken direct from the foundry to the machine shop, trouble is experienced from distortion due to the relieving of strains that exist in the green castings. Instead of seasoning the castings, they may be annealed at 600

deg. Fahr., which relieves the strains without unduly softening and weakening the material.

Heat treatment may also be used to advantage in softening chilled iron for machining and then rehardening it. The chilled iron castings are routed to the heat-treating department, subjected to annealing, being heated to 1750 deg. Fahr. for a short time. They then pass through the machining operations and are re-routed to the heat-treating department for quenching and drawing. This procedure gives a hardness practically equivalent to the original chill and without any tool trouble or loss of material.

#### Rapid Malleableizing

White iron can be broken down very quickly by heating to 1800 deg. Fahr. and then quenching in water and drawing at 1300 deg. The product obtained is readily machinable and has good strength. High ductility, however, is absent, a characteristic which is essential in high quality malleable cast iron. The process, however, is not intended to obtain maximum malleability, but rather a quick, strong intermediate product. The heat treatment of the white iron castings at 1750 to 1800 deg. lasts three hours and the drawing at 1200 to 1300 deg. takes 15 hr., whereupon a material is produced which may be termed completely malleableized in that it is free from combined carbon. It appears to differ from standard malleable iron principally in the fact that all of the original carbon content is retained. In regular malleable practice the carbon is bodily removed, whereas in the practice developed at the Holt Mfg. Co., all of the carbon remains in the form of temper carbon.

On the subject of welding, the speaker stated that frequently defects in finished surfaces can be salvaged by adding an alloy of copper-nickel with an electric arc. The weld is readily machinable and has a good bond with the iron. It has good elastic properties which reduce to a minimum the chances of cracking. It is believed that the application of this alloy can be greatly increased in connection with the electric arc, inasmuch as the acetylene torch requires extensive pre-heating and high temperatures.

It also seems practicable to salvage malleable iron castings by means of brazing. Because they cannot be welded without annealing afterward, does not mean that brazing is out of question.

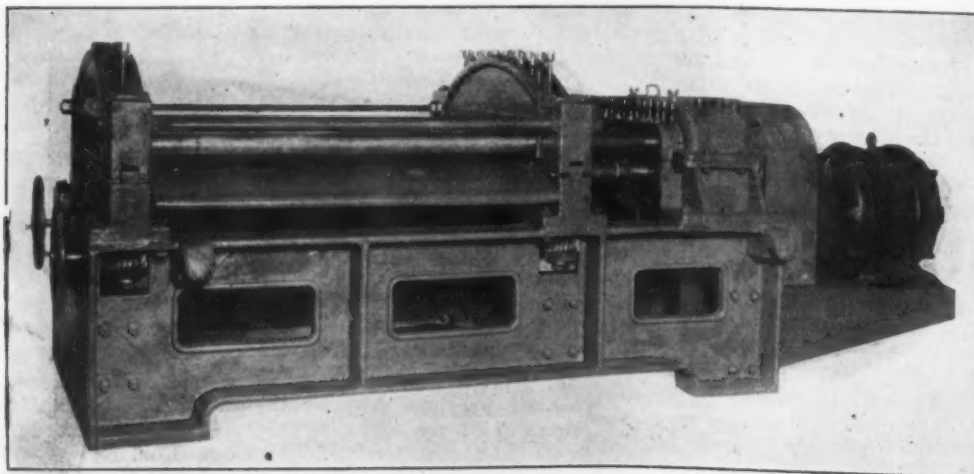
### Roller Leveller for Full-Finished Sheets and Jobbing Mills

A roller leveller for full finished sheets and also for use in jobbing mills to level sheets directly from the mill is here illustrated. This leveller, which has been brought out recently by the Aetna Foundry & Machine Co., Warren, Ohio, has 17 rolls 4½-in. in diameter made of steel of any analysis specified.

The rolls are driven by a newly designed universal coupling from a reduction gear box in which the gears run in oil. The universal coupling is of the ball and socket type and is designed to insure against vibration, back-lash or looseness during the life of the

machine, regardless of whether it is used for levelling light or heavy gage material. It is pointed out that this positive coupling is necessary for a leveller for full finish sheets in order to eliminate the danger of chatter marks being made on the surface of the sheets.

The machine is portable, being built on one common base having cast-iron lifting lugs so that it can be moved from one plant to another with a crane. The motor bracket is attached to the base at the right-hand as shown. The machine is built with rolls 48, 54 and 60-in. wide between housings. The company has developed a machine of similar design for use in light plate mills, this machine being made in widths up to 75 in. to handle the output of continuous mills.



The Leveller Has 17 Rolls Which Are Driven Through Reduction Gears and a Universal Coupling. The coupling is newly designed and is said to eliminate danger of chatter marks on the sheets

# Tool Builders and Users Compare Notes

## Recent Progress in Design Outlined by Manufacturers at Chicago Machine-Tool Meeting—Users Call Attention to Needed Improvements

THE respective viewpoints of users and manufacturers of machine tools were brought out in sharp relief at a machine-tool meeting of the Chicago section of the American Society of Mechanical Engineers, held at Chicago March 11. An afternoon session at the auditorium of the Western Society of Engineers brought out an attendance of 44, and at an evening dinner meeting at the City Club 100 were present. In view of the success of the meeting it is proposed to make it an annual affair.

Papers on "Trend of Machine Tool Design From User's Standpoint," by J. R. Shea, assistant superintendent of development, Western Electric Co., Cicero, Ill., and "What We Want in Machine Tools," by Robert R. Keith, chief engineer motor trucks and buses, International Harvester Co., Chicago, created lively interest and brought out spirited discussion. The trend of machine-tool design, Mr. Shea pointed out, has been greatly influenced by two important factors: (1) improvement of raw materials; (2) improvements in processes resulting in more efficient use of raw materials and setting up conditions making possible the use of semi-automatic or automatic machine-tool equipment.

The manufacture of any product brings up the question of the advisability of using general-purpose machines or specialized equipment. To find the right answer requires careful and thorough study of the problem at hand. Through consistent research and investigation, the Western Electric Co. is constantly making changes in its manufacturing practice. The evolution in the production of transmitter faces for telephones was cited as an example of changes in methods and materials used. Originally this part was made of cast brass and machined. Later it was made by punching a sheet and attaching a brass ring in two parts. It is now blanked from a sheet and formed by a series of punch press operations.

Recently a hot pressed method of making transmitter faces has been tried. First a square bar of brass is formed into a blank by a series of blows and then is punched, trimmed and machined. There have also been experiments with a phenol plastic or bakelite method, whereby the part is formed with heat under pressure with the metal parts inserted in the bakelite. A die cast method, using certain aluminum alloys is also being tried. Die casting produces the part almost to finished dimensions.

A new process is never adopted until its economy over the former method is fully demonstrated. If a given operation requires only a relatively small amount of time, a general-purpose machine can best be used. If production is on a large scale warranting practically continuous operations, special-purpose machines should be used.

### Believes There Is Room for Improvement

Mr. Shea is of the opinion that there is still a large field for improvement in machine tools. There is yet much to be desired in punch presses from the standpoint of protecting the operator and the tool and increasing production. Greater speed for screw machines is also a need which manufacturers are expected to supply in the near future. An increase in the speed of drilling machines has been made possible by the development of special spindles. The output of screw machines has been materially expanded by the application of individual motor drive. Maintenance costs have been lowered and the absence of belts and counter and line shafts makes for better illumination and ventilation, and reduces the expense and the time lost in moving equipment to new locations. The production of

milling machines, Mr. Shea commented, has been facilitated by the development of work-holding and indexing fixtures.

In the discussion an instance was cited where a battery of machines was speeded up to give double the former production. This move, however, resulted in so much bearing and tool trouble that it was necessary to revert to former practice. This illustrates the danger of speeding up machine tools beyond the limits fixed by the design.

With reference to this costly shop experience, Mr. Shea stated that it is a mistake to change the entire production methods of a shop before the advantages of the innovation have been proved in all details. Thorough experiments should first be made with one machine before changing practice on the rest of the equipment.

The quantity of a product to be manufactured has much to do with the type of equipment which should be used, added Mr. Shea. The set-up time for a complicated machine may more than offset the saving from use of such equipment. In developing new production equipment, Mr. Shea asserted, it is often advisable to work in cooperation with machine-tool manufacturers, who in many cases may have practically the machine desired, with the exception of a few minor alterations.

The crowding of machine tools to their maximum reasonable capacity found an advocate in Mr. Keith, the second speaker in the afternoon session. In his opinion, a shop engaged in an intensive manufacturing program should get the most out of its machines in order to be ready to take advantage of improved designs when they are developed. There is no type of equipment, he pointed out, which becomes obsolete so rapidly as the machine tool.

The rapid change in the past few years from jobbing conditions of manufacture to intensive production has strongly influenced the trend of machine tool design, placing emphasis upon specialization.

### Variation In Working Height an Obstacle

The title of Mr. Keith's paper was "What We Want in Machine Tools," and he was frank in outlining further possible improvements. In a production shop the arrangement of tools for the efficient handling of work is exceedingly important, and a variation in the working height of the tools is an obstacle to satisfactory operations. In Mr. Keith's plant the machines have frequently been anchored below the floor level in order to make for uniformity in working heights. Another difficulty encountered in arranging machine tools for production purposes is the fact that the driving pulley has a fixed position, sometimes set parallel and sometimes at right angles to the line. This suggests the possibility of using a primary bevel gear drive, preferably spiral gears, so arranged that the carrying arm is on a swivel, which will permit of its being turned at whatever angle required. Inadequacy of oiling arrangement indicates another field for further improvement on the part of the machine-tool manufacturer.

The maintenance problem on machine tools is one of the most vexing confronting the users. Repair parts from builders often will not fit. In fact, builders might well concentrate on more strict interchangeability of parts. There is a need for locking devices for bearings that really lock. Loose pulley bearings are generally inadequate and in Mr. Keith's plant are being replaced with inserted ball-bearing sleeves, which are packed with lubricant once a month. This has enabled the company to reduce the number of oilers materially.

In boring cast iron, it was said to be difficult to obtain a machine-tool which will do the work with a



freedom from chatter. Freedom from chatter, he stated, largely controls the life of a tool. A spiral bevel gear drive would help to eliminate chatter in a machine tool and splendid results have been obtained by placing a fly wheel in the driving train.

With reference to milling machines, Mr. Keith said that the weakness of the overarm had been largely overcome by different designers. The bearing surface of the table is still inadequate, however, and the knee lacks sufficient rigidity. Designers, furthermore, have failed to take into consideration that under production conditions cutters are bound to work for a time after they have commenced to get dull and therefore the strains imposed on the bearings are multiplied considerably. It is difficult to standardize the time to change cutters because of the variability of the materials used.

The manual movement of the arm of the radial drills is also an obstacle to quantity production work. The inertia of the large mass is so great that the operator quickly tires from constant movement of the arm. A friction driving mechanism which would respond to a pull of a handle would materially help the piecework operator in handling the arm.

Experience argues against the use of a common lubricating system for all of the machine tools in a given shop. Such a system is an obstacle to the ready rearrangement of the location of tools and is also sometimes tied up by the settlement of dirt in the pipe lines. A self-contained lubricating system for each tool is to be preferred.

#### Pro and Con of Repair Part Prices

The prices charged for repair parts by machine tool builders, said Mr. Keith, always raise the question whether it is cheaper to make repair parts in one's own tool room one piece at a time and at great expense, or to buy them from the manufacturer.

In commenting on Mr. Keith's remarks, J. B. Armitage, chief engineer, Kearney & Trecker Corporation, Milwaukee, stated that the cost of repair parts is high and will continue to be high because machine tools are built and not manufactured. Machine-tool makers are constantly changing the designs of their machines and must continue to change them to keep pace with progress in the industry. The builder has no way of knowing what parts will be in demand because when he first puts out a new design of machine he does not expect any parts to break.

On the subject of knee construction, Mr. Armitage said that knee deflections are not one-quarter those of the overarm with the same cutter thrust, notwithstanding the fact that Mr. Keith admitted that overarm weakness has largely been remedied.

With reference to making bearings large enough to take care of loads imposed by dull cutters, Mr. Armitage said that so far as torsional strains are concerned, it does not matter whether a large cutter that is sharp or a smaller dull cutter is used; in either case the machine may be taxed beyond its capacity. The point is that only so many horsepower can be transmitted through the shaft regardless of the size or condition of the tool. The cutter load is something designers have no control over, from the cutter end of the machine. They have, however, control over the horsepower which they can recommend for a certain size machine. If a man can put only 10 hp. through his machine, the dull cutter will not absorb any more power than a large cutter that is sharp.

In additional remarks on this subject, Mr. Keith stated that the machine-tool maker will learn something about costs when he manufactures instead of builds. A two-cylinder tractor, built under what might be termed jobbing conditions before the war at low pre-war material and labor costs, actually cost more than a far superior machine, a four-cylinder tractor, manufactured at the present time. Furthermore, the repair business of the tractor department of the International Harvester Co. amounts to over \$2,000,000 a year and pays a profit.

A paper on "Die Cast Versus Machined Parts" was read by D. L. Colwell, metallurgist, Stewart Mfg. Cor-

poration, Chicago. Die casting, it was explained, is the casting of metals in permanent dies under comparatively high air pressure. At present, the size of the die casting is limited to 15 to 20 lb. The only materials which can be successfully die cast are those with a melting point below 1400 deg. Fahr. Great progress has been made in this field and a wide field for further development is in prospect. A fair comparison between a die casting and a machined part can only be made when all costs connected with both processes are carefully considered. Mr. Colwell described the die casting process in detail and showed illustrative slides.

#### Present Planers Superior to Older Machines

The evening program was devoted to a symposium on "Finishing Of Plane Surfaces." Planers were discussed by Forrest E. Cardullo, chief engineer, G. A. Gray Co., Cincinnati. The planer which has been developed during the last five years is so superior to the older type, he said, that it will produce from 30 to 60 per cent more work in the same time, using the same tools, methods and cutting speed. Furthermore, the modern planer, when properly tooled and handled by a skilled operator, will produce work of extremely close accuracy. It is a powerful production tool and is particularly adapted to work in cast iron. For work in this material, he said, no other type of tool should be considered. Outside of that field, a number of machines compete with the planer and which particular tools to use must be determined by careful study of the problem at hand.

In one type of planer work where accuracy is not important, the only requirement is that the planer shall hog off huge chips from the hardest and toughest steel that it is possible to machine. To meet this requirement, the frog and switch planer was built.

Careful consideration should be given to the matter of fixtures, gages, tools and methods of work. It does not require the same amount of time and expense to tool up a planer for a production job as it does to tool up a large milling machine, but it pays to equip the planer properly for the work in hand. Fixtures are made for particular jobs and universal fixtures have been devised to take many kinds of jobs and to replace odd bolts, straps, jacks and wooden braces which frequently give trouble by loosening under the cut and which are always liable to slip and spoil a job. Tools should be properly ground with keen edges and with clearance and cutting angles suitable for the material to be cut.

On heavy roughing cuts on a planer table metal is removed by a belt-driven planer at the rate of 40 cu. in. per min., or 600 lb. per hr., notwithstanding that the tools are cutting only 75 per cent of the time. A planer-type milling machine of special design and extra heavy construction could rough this table out in less time than the planer. However, the cost per piece, said Mr. Cardullo, would be higher on account of the higher overhead and the very much higher tool room expense.

#### Usefulness of Slab Millers Has Doubled

The heavy milling of large plane surfaces was discussed by A. H. Lyon, chief engineer, Ingersoll Milling Machine Co., Rockford, Ill. The high capacity of the slab milling machine is indicated by the fact that cast iron tables for such machines are milled at the rate of 154 cu. in. of metal removed per min. The weight, power and general usefulness of slab millers has almost doubled in 10 years. A decade ago a machine having 3½-in. diameter spindles, 2½-in. drive shafts, driven by a 20-hp. motor and weighing 34,000 lb., was considered a good machine. For the same work today one would recommend a machine having 7-in. spindles, 4-in. drive shafts, driven by a 40-hp. motor and weighing 70,000 lb.

Mr. Lyon briefly touched on high-production, single-purpose milling machines such as are used in automobile shops. It is recognized, he said, that milling is the proper way to obtain flat surfaces for cylinder heads, cylinders, crank cases and oil pans. This work is done on fixed rail milling machines, rotary, drum type and



traveling head machines, the type of machine being determined largely by the production required. These machines are equipped with cutters and fixtures and are set up permanently for one job.

The general-purpose machine is used for milling heavy castings such as are handled in machine-tool shops, steel forgings of locomotive shops and heavy steel castings, such as safety deposit vault doors, car frames and work of that general character. The machines used for this kind of work have a bed and table somewhat similar to a planer, with upright side housings and an adjustable crossrail.

Heavy steel castings, which in the past were considered a job for the planer or slotter, are now successfully milled in about one-third the planer time. Locomotive side-rod forgings of alloy steel are now milled, two rods side by side on the table, at a feed of 8 1/2-in. per min. and channeled at the rate of 8-in. per min. Steel billets are skinned, that is the surface imperfections are removed, on a milling machine at a feed of 34 in. a min. An automobile builder who formerly made crank cases of aluminum now proposes to make them of cast iron and by improved methods of milling and drilling estimates that there will be no increased machining cost. These cases will be milled at the rate of 15-in. feed per min.

The principal competitors for the class of work handled on general-purpose machines are the planer or slotter, probably because on those machines there is but a single point tool to set up and keep in condition. However, this tool in action has a reciprocating motion and is doing work only on the forward stroke, while with a milling machine, the cutters have many feeds set into their periphery, a considerable number of which are in action at a time, and with a multiple head machine, several cutters are working simultaneously.

#### Plane Surfaces Finished by Disk Grinders

In discussing the finishing of small plane surfaces, F. F. Gardner, vice-president Gardner Machine Co., Beloit, Wis., gave a brief history of the disk grinder and its present position in the machine tool field. Flat surface grinding never will remove as many cubic inches of stock per minute as milling cutters. Milling cutters never have and probably never will be able to carry through on light rapid cuts—sometimes in scale and sometimes in sand—and still stand up.

"We know that there is a distinct dividing line between milling machines and flat surface grinders. . . . We are not now considering pieces with offset surfaces—pieces with surfaces to be finished below surrounding surfaces, and pieces with two or more sur-

faces out of the same plane—such as a piece which could be straddle milled—using a vertical spindle to finish the third surface. Regardless of these limitations, there is in every line of manufacture room for disk or flat surface grinding machines." Some materials, such as aluminum, are difficult to grind in large areas due to distortion from heat generated. By recessing the areas to be ground, a very substantial cost reduction has resulted.

Where a surface is plane, with no steps and no shoulders to finish up to, the piece may be brought against a disk wheel with its full surface and, with practically no chucking in a fixture, may be finished in less time than it could be placed in a milling machine fixture. That is a typical flat surface grinding operation. A successful flat surface grinding job starts in the drafting room. There the piece is planned for a rapid finish on a disk grinder; the engineers will see to it that the pattern is made with little or no finish left for grinding instead of the usual 1-16 or 1/8 in. The ordinary rapping of the pattern generally provides enough finish. The drafting room will see to it that wherever possible the surface to be finished by grinding is relieved, recessed and reduced in area as much as possible.

#### Modern Milling Machines Remove More Metal

Whereas in 1910 and 1911 a milling machine would remove 0.3 to 0.4 cu. in. of cast iron per hp. per min., modern machines will remove 1 to 2 cu. in. per hp. per min. on average milling operations, said W. W. Tange-man, Cincinnati Milling Machine Co., in discussing "Milling Plane Surfaces." The removal factor for steel is one-half to 1 cu. in. per hp. per min. and for the softer metals, such as brass, aluminum, etc., as high as 4 to 6 cu. in. These figures were stressed as comparing very favorably with power consumed to remove metal by any grinding, turning or planing process.

The perishable tool cost and maintenance must also be considered. The wear and tear on a milling cutter is not much greater when 1/8 or 3-16 in. of stock is removed than for 1-16 or 3-32 in. This is not the case with a grinding wheel where there is a definite relation between wheel consumed and metal removed, said Mr. Tange-man. From the standpoint of maintenance the milling machine usually costs less than the grinding machine because it is not made up of high speed elements and is not subjected to the wash of abrasive which the grinder must contend with.

Other elements entering into the costs of operating different machines are: Interest and investment in machine and fixtures, floor space rental and direct labor.

and Their Application in Engineering Work, by Prof. Bradley Stoughton, Lehigh University. Motion picture on the story of the heat treatment of steels, U. S. Bureau of Mines.

#### Meetings of Mechanical Engineers

Among meetings scheduled by local sections of the American Society of Mechanical Engineers are the following:

Akron, March 31—At Engineering Building, University of Akron. Subject: Instruments for Measurement. Speaker: E. G. Bailey, president Bailey Meter Co., Cleveland.

Buffalo, April 14—Subject: Materials Handling. Illustrated with motion pictures. Speaker: M. S. Schneider, engineer Link Belt Co.

Cleveland, April 6—Subject: The Engineering Profession—Its Antiquities and Obligations. Speaker: Dr. W. F. Durand, president A. S. M. E.

Colorado, March 27—At Metropole Hotel, Denver, at 6.30 p. m. Subject: Shop Production Methods in the Burlington shops of Denver. Speaker: Charles Erwin, general superintendent western division C. B. & Q. Ry.

Erie, March 24—Chamber of Commerce Auditorium, at 8 p. m. Subject: Modernization of Industrial Power Plants. Speaker: Egbert Douglas, Cahill & Douglas, Cincinnati.

Hartford, April 7—Joint meeting with the American Society for Steel Treating. Subject: Present State of Art of Malleable Iron. Speaker: H. W. Schwartz, manufacturing research division, National Malleable & Steel Casting Co.

Newark, N. J., March 25—Downtown Club. Subject: Standardization of Fits and Tolerances. Speaker: Major Earl Buckingham.

New York, March 31—At Engineering Societies Building. Subject: Unit System of Burning Pulverized Coal. Representatives of various companies participating.

Philadelphia, March 24—At Engineers' Club at 8 p. m. Dinner at 6.30 p. m. Subject Heat Treatment and Why, by H. C. Knerr, metallurgical engineer; on Heat Treated Steels

#### Edwin S. Carman Addresses New England Foundrymen's Association

Edwin S. Carman, secretary and chief engineer the Osborn Mfg. Co., Cleveland, was the guest of the New England Foundrymen's Association March meeting, held at the Exchange Club, Boston, on the evening of March 11. He gave an illustrated talk on the mechanical conditioning of foundry sand and its effect upon casting quality. His talk brought considerable discussion from the 80-odd foundrymen attending, some exceptions being taken on the question of proportionate losses of sand per ton of casting.

George F. Pettinos, Philadelphia, was admitted to membership in the association at a short business session held prior to Mr. Carman's address. R. F. Harrington, president, presided.

Beehive coke produced in the week ended March 7 is estimated by the Geological Survey at 244,000 net tons, compared with 254,000 tons in the preceding week and 326,000 tons last year. To date, 1925 production is given as 2,469,000 tons, compared with 2,665,000 tons last year.

## CHILE TO MAKE ITS OWN STEEL

### Raw Materials Reported Available—Success of Project Would Interfere with Shipments from United States—31,854 Tons in 1924

A company, organized in Santiago, Chile, during April, 1924, will construct a hydroelectric plant and apply the energy obtained to the production of iron and steel. This new company has been investigating the supply of raw materials and optioning sources. An iron deposit reported to contain 40,000,000 tons has been secured on a royalty basis. Other properties containing larger deposits of high-grade ore are open to development under somewhat higher royalties.

#### Much Material Needed from Outside Chile

Scrap may have to be obtained from sources outside of Chile, as there does not seem to be enough old iron and flux material available locally to fill the wants of the smelting companies now operating. The steel plant's estimated consumption of 15,000 tons of charcoal will have to be supplied from sources adjacent to Valdivia until its production can be placed on an organized basis. Limestone is found in many parts of the country and can be had in the quantities desired. Domestic silica and fire brick also are available, but basic bricks, dolomite, magnesite, manganese, silicon and special alloys would have to be imported.

The metallurgical plant that has been recommended to the new company would produce 45,000 tons of iron

and steel yearly, operating under normal conditions. This tonnage would displace an equal amount of similar material now being imported from European and American sources. The plant has been designed to produce pig iron, excepting Thomas iron, rolled steel bars, plates, rails, beams, angles, rods and castings. The Chilean consumption of these commodities, not including castings, is represented by the quantity of each imported yearly, as there is no national production of pig iron or steel at present, apart from a small amount of bars made from resmelted scrap.

#### What Chile Bought of United States Last Year

Chile stood sixth in the list of leading Latin American markets for United States iron and steel during 1924, being outranked by Cuba, Mexico, Brazil, Argentina and Colombia. United States concerns sent to Chile 31,854 gross tons of iron and steel during the year, or 1.7 per cent of our total exportation of iron and steel. This included 159 tons of iron bars, 1215 tons of steel bars, 5932 tons of sheets and plates (of which 3281 tons was tin plate), 6715 tons of structural iron and steel, 3971 tons of which were structural shapes not fabricated, 1215 tons were fabricated structural shapes, and 1119 tons ship and tank plates. Nails and tacks amounted to 1695 tons and bolts, nuts, rivets and washers (except track) to 543 tons.

Heavy rails were 9102 tons and track accessories, 909 tons. There were 875 tons of car wheels and axles, 2551 tons of tubes, pipes and fittings, of which 764 tons were welded black pipe, 626 tons were welded galvanized pipe and 523 tons were casing and oil line pipe. Wire and manufactures amounted to 901 tons.

## Notable Performance of Tata Furnaces

A notable blast furnace performance, particularly in terms of the number of pounds of combustible required per ton of pig iron produced, is reported from the plant of the Tata Iron & Steel Co. in Jamshedpur, India. Blast furnaces C and D averaged 565.1 tons each per day for the month of January and used on the average 1593.5 lb. of carbon per ton of pig iron produced. On the average there was a consumption of 2151 lb. of coke per ton of iron, and the fixed carbon of the coke being 74.08 per cent, the carbon per ton was  $2151 \times 0.7408 = 1593.5$  lb.

The accompanying table gives the data, which were obtained from the consulting engineers of the company, Perin & Marshall, New York. It will be noticed that the scrap used in the burden (and this being made up of ingot molds) was an exceptionally small item of the total. The table gives the analysis of the ores used and the proximate analysis of the coking coal as well as the make-up of the burden.

Furnace D made as high as 672 tons on one day, as shown in the table, and furnace C, 636 tons.

Production of C and D Blast Furnaces, Tata Iron & Steel Co., in January, 1925

	C	D	C and D
Total pig iron, tons...	17,414	17,676	35,090
Average per day, tons..	561.74	570.19	565.1
Average coke per ton.			
lb. ....	2,102	2,200	2,151
Highest day, tons.....	636	672	....

#### Charge per Ton of Pig Iron

Ore, tons .....	1.52 <sup>1</sup>	1.607 <sup>2</sup>
Mang. ore, lb.....	56½	22½
Dolomite, lb. ....	1,226	1,216
Scrap, lb. ....	34 <sup>3</sup>	43 <sup>3</sup>
Scale, lb. ....	....	23

#### Average Analysis of Raw Materials

Iron ore—	Fe	SiO <sub>2</sub>	P	Mn	Al <sub>2</sub> O <sub>3</sub>
Sulaipat .....	65.86	2.48	0.054	0.21	1.29
Badampahar ..	56.06	4.89	.09	.54	4.31
Gurumahsani ..	59.36	5.11	.063	.47	4.52

	Ash	Vol. Matter	Fixed C
Coking coal (average all collieries) .....	17.11	25.20	57.69
By-product coke .....	23.73	2.19	74.08

<sup>1</sup> 25 per cent Sulaipat and 75 per cent Badampahar and Gurumahsani.

<sup>2</sup> 50 per cent Badampahar and 50 per cent Gurumahsani.

<sup>3</sup> Ingot molds.

## Production of Aluminum in 1924

New aluminum produced in the United States in 1924 is reported by the Geological Survey to have had a value of \$37,607,000, with an average price through the year of about 28 cents per lb. Total production, therefore, amounted to approximately 67,000 net tons. Domestic demand for aluminum was somewhat less than in 1923, particularly for automobile parts, where pressed steel has partially displaced it.

Exports of aluminum are reported at 6563 net tons, of which 1678 tons represented ingot, scrap and alloys; 1787 tons, tubes, moldings, castings and other shapes; 1493 tons, plate, sheets, bars, strips and rods and 513 tons utensils for table, kitchen and hospital use. Imports in 1924 were more than twice the tonnage of exports, having been 15,294 net tons, of which 14,697 tons were crude metal from scrap and alloy, 395 tons manufactured plates, sheets and bars and 202 tons hollowware.

## To Eliminate Excess Milling Cutters

More than 60 trade and technical organizations and 300 manufacturing firms have been invited by the Division of Simplified Practice, Department of Commerce, to attend a conference on March 25 to consider eliminations in the milling cutter industry. The program, as developed after several months of study of demand and variety, calls for the elimination of approximately one-third of the varieties now made. The invitations sent out cover a wide range of manufacturers in 28 States, and a large attendance is looked for.

The milling cutter industry made a reduction of excess variety amounting to about 40 per cent only a few years ago. The resultant benefits were such that the cooperation of the division was asked in bringing about further reductions of slow-moving, excess or obsolete items.

The National Machine Tool Builders' Association has advised its members that the Industrial Machinery Division of the Department of Commerce, Washington, has compiled a list of machinery dealers in Germany and copies of this list will be furnished to American manufacturers who desire agencies in that country.



## BRAKE DRUM GRINDER

### Special Machine Arranged for Grinding Either External or Internal Drums

Advances in the refinements of automobiles, such as balloon tires and four-wheel brakes, have made it necessary to equip these cars with brake drums that are true. The use of the four-wheel brake has brought the necessity of increasing the leverage in the brake mechanism and this requires smaller clearance. This means that the brake bands must be adjusted more closely and unless the drums are true there will be dragging of the brakes, resulting in noise and loss of effective power. There is also a tendency to use brake drums of higher carbon steel, which increases the diffi-

A front view of the machine arranged for internal grinding is shown in Fig. 3. In order not to use a cup grinding wheel, the grinding wheel head has been placed at an angle and the grinding wheel is dressed off at an angle by means of the diamond located at the back of the grinding wheel. Fig. 4 is a close-up view of the self-contained grinding wheel head showing the wheel drive motor, driving belt, water nozzle and grinding wheel guard in position. This machine carries a 10 in. diameter grinding wheel rigidly mounted on a heavy spindle, thus eliminating the difficulties frequently encountered when the grinding wheel is mounted on the regular internal fixture. It operates on the back of the hole and its rotation is such that all the grindings are directed downward into the water channel.

Both of these machines are equipped with direct

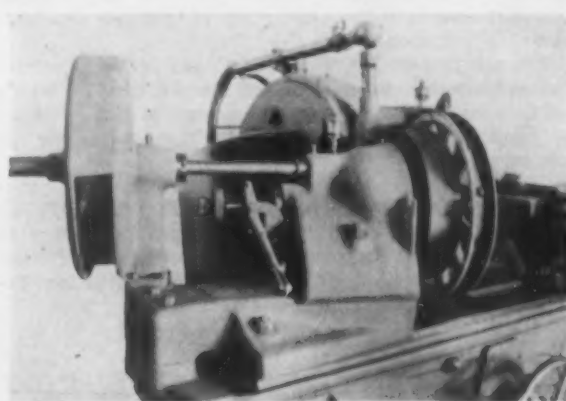
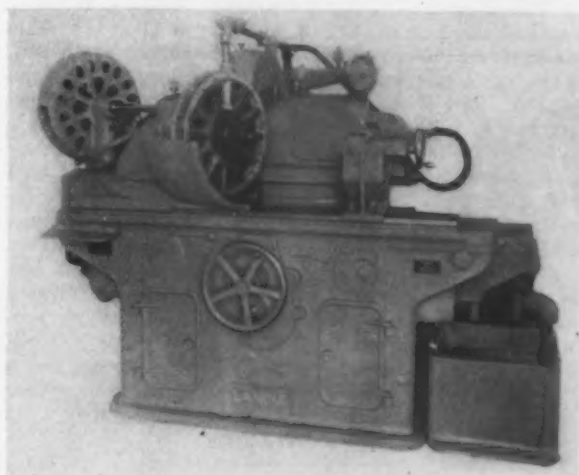
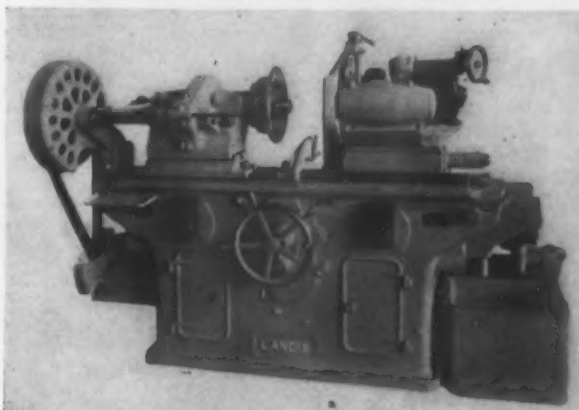


Fig. 1. (Left) Front View of Machine Arranged for Grinding External Brake Drums

Fig. 2. (Above) Close-Up View of the Headstock of the Same Machine.

Fig. 3. (Lower Left) Machine Arranged for Grinding Internal Drums

Fig. 4. (Below) Close-Up View of Self-Contained Grinding Wheel Head



culty of machining them. With the proper selection of grinding wheels, however, the grinding of the high carbon brake drums is said to be accomplished as easily as in the case of the low-carbon drums.

Machines especially equipped for grinding these brake drums are shown in the accompanying illustrations. These machines are a recent development of the Landis Tool Co., Waynesboro, Pa., and are arranged for grinding either external or internal brake drums of the sizes used on all present types and classes of automobiles.

The arrangement for external grinding may be noted from Figs. 1 and 2. In Fig. 1 the machine is shown with the wheel mounted in place on the holding fixture in the position for grinding, the collet lever, draw rod and clamping bushing being also shown. Since the drum face extends under the rim of the wheel, the headstock is thrown at an angle so that the grinding wheel will clear the rim. The grinding wheel is dressed off at an angle to correspond to the angle of the headstock by means of the profile truing fixture shown on the machine. Fig. 2 is a close-up of the headstock with wheel and drum mounted, along with the collet lever for operating the work-holding fixture.

motor drive, with separate motor for driving the work and grinding wheel. As the machines are arranged for one particular size and type of drum, constant-speed motors are employed and the speed-changing mechanism in the machine has been eliminated.

The Tenth International Purchasing Agents' Convention of the Informashow, will be held at Milwaukee, Wis., May 25 to 28. The general chairman is Walter H. Wenzel of the Vilter Mfg. Co., Milwaukee. The Milwaukee Hotel Managers' Association promises 1000 to 1500 rooms, and asks that all reservations be made direct to the hotels. The sessions of the convention will be held in the Milwaukee auditorium.

The members of the Electric Hoist Manufacturers' Association report a decrease of 11.40 per cent in the number of hoists ordered in February as compared with previous month, and a decrease in the value of hoists ordered of 12.63 per cent. Shipments of hoists in February increased 12.76 per cent over shipments in January, 1925.

### Brass Manufacturers Urged to Reduce Varieties of Their Products

WASHINGTON, March 17.—Addressing the meeting of the National Association of Brass Manufacturers on Thursday of last week, E. W. Ely, of the Division of Simplified Practice, Department of Commerce, urged the association to take greater advantage of benefits arising from simplifying and reducing the varieties of its products. He explained that this should be done by salesmanship on behalf of the producers or distributors if either they or the ultimate consumer are to obtain benefits from cutting away excessive varieties or items. In effect, Mr. Ely advocated that producers should make known what had been accomplished by way of reducing costs and improving production as a result of eliminating excessive types. The talk of Mr. Ely was interpreted as meaning that manufacturers not only should eliminate excessive varieties and thus reduce costs but should follow these up by making the fact known to consumers.

The address of Mr. Ely was a part of the program of the National Association of Manufacturers which met here on Wednesday and Thursday of last week at the headquarters of the United States Chamber of Commerce.

"Standards, or limited varieties," Mr. Ely continued, "do not sell themselves. Unless there is an effort on the part of the producer and distributor to show the consumer that there is something in it for him, attempted simplification or standardization becomes more or less of a gesture."

### Thropp Blast Furnaces to Be Sold

A public auction sale of the properties of the Joseph Thropp Co., Inc., will take place Tuesday and Wednesday, May 5 and 6, by order of Andrew S. Webb, 116 Chestnut Street, Philadelphia, the receiver. Samuel T. Freeman & Co., auctioneers, 1808 Chestnut Street, Philadelphia, will conduct the sale. On Tuesday, May 5, the sale will take place at the Saxton blast furnace, Saxton, Pa., beginning at 10 a.m., and at the same hour on the following day there will be a sale at the Earleton furnace, Everett, Pa. In addition to the two blast furnaces, the properties of the company include the Kearney coal mine with 170 beehive coke ovens; the Gordon coal mine, including 67 Mitchell coke ovens; the Melrose coal mine, including 90 beehive coke ovens and the Buffalo mine; a limestone quarry, 14 dwellings and a store at Saxton, Pa., and six houses at Wingdon, Pa.; ganister mining rights in the Tussey Mountains, a railroad right of way from Mount Dallas to the Maryland line and iron ore rights on approximately 19,200 acres in Bedford and Huntingdon, Allegheny County, Md., and Berkley and Jefferson counties, W. Va.

### Supply Convention at Atlanta in May

The Southern Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association are making plans for their joint annual convention, which will be held on May 5, 6 and 7 at Atlanta, Ga. It will be the only meeting this year of both of these associations.

### Discuss Corrosion

A symposium on corrosion will be the subject at one of the sessions of the annual spring meeting of the American Chemical Society to be held in Baltimore, Md., during the week of April 6. It will be held under the auspices of the division of industrial and engineering chemistry. The symposium will deal with such general fields as the corrosion of brasses, of iron, of aluminum alloys, of stainless steels, of the effect of minute films on corrosion, of the corrosion of alloys at high temperature and of the corrosion of antique bronzes.

Among the speakers will be Dr. W. R. Whitney,

Schenectady, N. Y., original exponent of the electrochemical theory; Dr. W. D. Bancroft, Cornell University, an authority on the physical chemistry of corrosion; W. H. Bassett, American Brass Co., Waterbury, Conn., an authority on corrosion resisting alloys, and Dr. Guy D. Bengough and Dr. Ulick R. Evans, foremost authorities of England. The chairman of the symposium will be Robert J. McKay. Papers will be read by Dr. F. N. Speller, National Tube Co., Pittsburgh; N. B. Pilling and R. E. Bedworth, American Brass Co., and Prof. George N. Enos, University of Cincinnati. Dr. Colin G. Fink, Columbia University, New York, will describe some new contributions to the subject of the corrosion of metals.

### Disston Night Enjoyed by Philadelphia Foundrymen's Association

The Philadelphia Foundrymen's Association, Inc., was addressed on the evening of March 11 in the Manufacturers' Club by S. Horace Disston, vice-president in charge of sales of Henry Disston & Sons, Inc., Philadelphia. Mr. Disston through the medium of motion pictures took the foundrymen and their guests on a tour of his company's huge plant at Tacony. Aided by the pictures, he explained the making of Disston saws and other tools from the molten steel in the crucible to the finished products and then on to their application in the foundry, lumber mill and other industries.

The meeting, which was attended by over 100 persons, was preceded by one of the association's famous shad dinners. There were some musical numbers provided through the courtesy of Henry Disston & Sons, Inc., as well as a fine briar pipe souvenir presented with the compliments of the House of Disston. The evening was voted one of the most complete and enjoyable of its kind ever held.

### Building Construction in February

February building contracts amounted to \$299,260,000, according to compilations of F. W. Dodge Corporation, covering about seven-eighths of the country. This was slightly under the figure for February, 1924, and slightly over the figure for January, 1925. The total for the first two months of the year was \$595,653,000, a decline of ½ per cent from last year.

Residential buildings, as for many months, occupied first position, with 45 per cent of the total value. Public works and utilities covered 18 per cent, commercial buildings 13 per cent and industrial buildings only 7 per cent of the total.

### British Pig Iron and Steel in February

LONDON, ENGLAND, March 14 (By Cable).—The pig iron production in February was 534,100 gross tons, or less than the January output of 569,400 tons. Both months are still under the 1924 monthly average.

The February steel output was 646,400 tons or an increase over the 605,100 tons made in January. Neither, however, equaled the 1924 average rate of 685,100 tons per month.

Comparative production figures for the British steel industry in gross tons per month are as follows:

	Pig Iron	Steel Ingots and Castings
1913, per month.....	855,000	639,000
1920, per month.....	669,500	755,600
1921, per month.....	217,600	302,100
1922, per month.....	408,300	486,000
1923, per month.....	619,800	707,400
1924, per month.....	609,900	685,100
January, 1925 .....	569,400	605,100
February .....	534,100	646,400

The Hocking Valley Railroad Co. has begun work on redoubling its Parsons Avenue yards, Columbus, Ohio. The company has let contracts for double-tracking its route from Columbus to Fostoria, Ohio. The new yards will have a 4000-car capacity, instead of 2200 as at present. The yard expansion work is being done by the company.



## TREND OF IRON AND STEEL MARKETS

(1) Steel production continues above the line of normal trend and iron production is high in proportion to steel output.

(2) The price structure in iron and steel continues weak and is likely to remain so until readjustment in production occurs.

(3) The statistical position of iron appears to have lost strength more rapidly than that of steel, and the iron market is now in a rela-

tively weak position, with even lower prices probable.

(4) A period of irregular readjustment among the various factors, such as coke, pig iron and the various semi-finished and finished steel products, is going on, which should soon terminate in a rather stable condition on an average basis which will be a little lower than at present.

BY DR. LEWIS H. HANEY

Director, New York University Bureau of Business Research

### General Situation in Iron and Steel

THE immediate trouble with the iron and steel market lies in the demand for secondary products. Production has been ex-

that the condition of railroad equipment is such as to preclude any great expansion, and accordingly we find that unfilled orders for locomotives in February were only 30 per cent of the 1920 average, against 38 per cent a year ago and 31 per cent in January. Building activity is at a lower rate than in

urgent or spontaneous. A large part of the buying has been at the old lower prices, and when stocks have been built up the buying has fallen off.

On the supply side overproduction has existed, and recently this has been most apparent in the case of pig iron and a few special

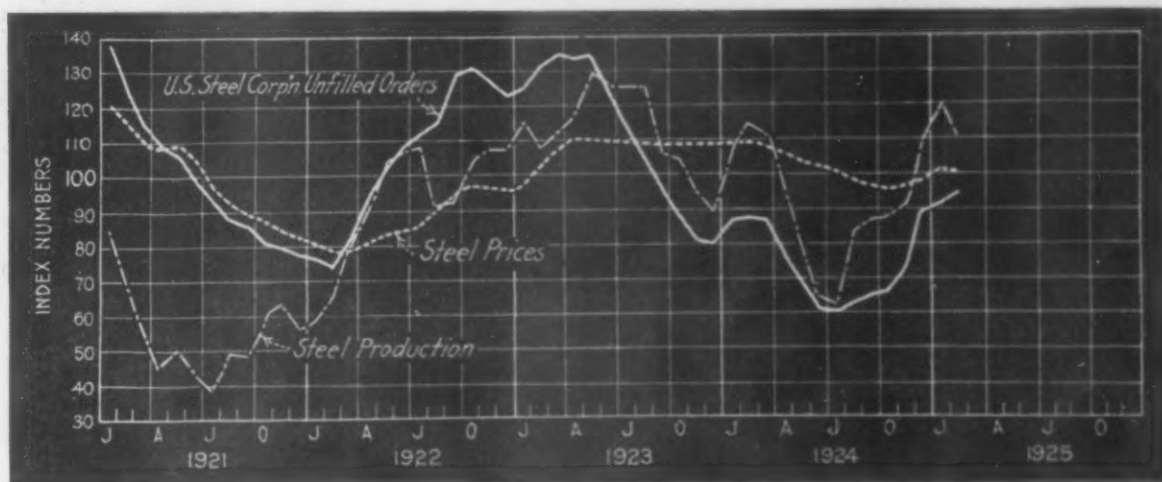


Fig. 1. Steel Trends: Production, Unfilled Orders and Prices

The price curve represents the movement of THE IRON AGE composite index of finished steel. The production curve represents the true trend of ingot output, the monthly figures of the American Iron and Steel Institute being adjusted to eliminate normal growth and the merely seasonal variations. The unfilled orders are as reported by the United States Steel Corporation, adjusted to eliminate seasonal variation.

panded with the idea that business would expand and prices have been marked up with the idea of encouraging forward buying.

Business however, has shown but very moderate expansion and buyers have merely filled in their stocks at the old prices. Consumption has not been sufficient to support higher finished steel markets.

As has been pointed out in this service, while the demand for steel is fairly good, there is no prospect of its reaching boom proportions. It has been forecast in these pages

recent years. Even the agricultural implement industry, while showing improvement, is not so active as might have been expected on the basis of higher grain prices.

The whole story is told by the fact that unfilled orders, while increasing, are relatively small, and orders have shown no such continuous rate of gain as occurred in 1922, for the simple reason that there was no great accumulation of long deferred requirements as a backlog.

The demand has not been

steel products, such as sheets. It seems reasonable to infer that the longer the present high rate of iron and steel production is maintained, the more certain and the more extensive will be the sagging in the markets.

At present the tendency appears to be to curtail production moderately. Assuming that this is to be the program, the logical outcome would be a relatively short period of irregular weakness in iron and steel markets followed by stabilization.

### Steel: Demand, Supply and Price

THE steel situation may be put in a nutshell as follows: The statistical position has improved slightly, but is still weak.

The trend of steel production, as shown in Fig. 1, indicates a reaction from recent high levels, after allowing for merely seasonal variations and for normal growth. The curve of steel ingot production turned downward in February. This is a step in the right direction, but steel production is still considerably above normal. In fact the adjusted curve stands at almost the same level as in February, 1923, and again in February, 1924.

The unfilled orders of the Steel Corporation increased in February

apparent trend toward reducing output, makes it unlikely that any considerable decline in the composite average of steel prices will occur. Certain individual items, such as sheets, are likely to weaken further, and the whole structure may sag a little, but the outlook in general appears to be for a period of rather stable prices.

### Pig Iron: Production, Stocks and Prices

AS shown in Fig. 2, the upward trend in pig iron production was checked in February. It is high time that such should be the case. Of late the statistical position of iron has been decidedly weakened. The ratio of pig iron production to steel ingot production has reached a level almost as

clined in recent weeks, so that iron prices may in general be said to be from 50c. to \$1 below the recent high point.

Further weakness is indicated in the iron market. Price concessions are reported even in the South. The downward trend of scrap is significant. Production is high in comparison with prices, and stocks of pig iron are still large.

### Price Trends

GLANCE at Fig. 3 shows that at the end all the curves were either holding level or declining. In a word, the general situation in iron and steel markets appears to be one of irregular weakness. In most cases the best that can be said is that prices are being

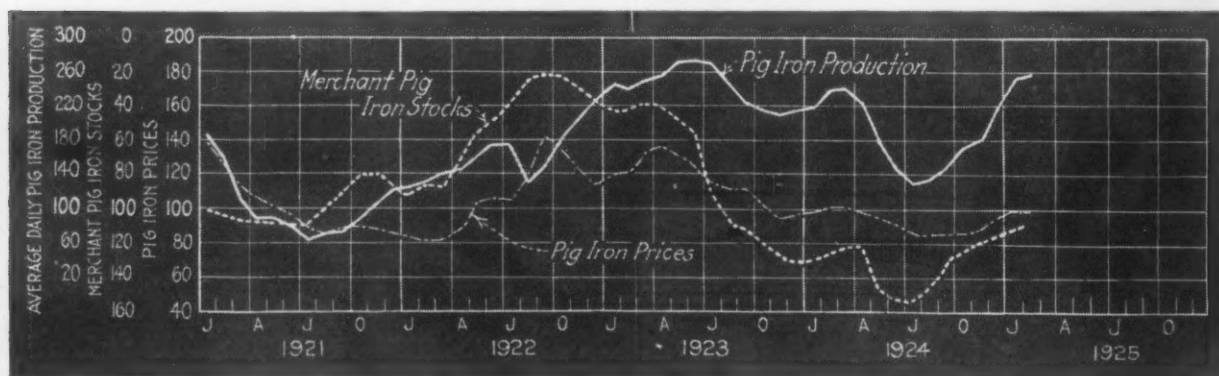


Fig. 2. Iron Trends: Production, Stocks and Prices

The production curve is the average daily production of pig iron, adjusted to eliminate the usual seasonal variations. (This curve differs from the steel production curve in that the long-time trend has not been eliminated.) The curve showing trend of stocks is drawn on an inverted scale, so that the low points represent the accumulation of large stocks. The price curve shows the trend of THE IRON AGE composite for pig iron

more than expected. The gain was even larger than the one which occurred in January. One can never be quite certain as to the exact significance of small changes in unfilled orders, but taking the February figures at their face value, they support the conclusion that the statistical position of the industry has improved a little.

The curve of unfilled orders, however, is still lower than it was throughout most of 1922 and 1923. It is still relatively low in comparison with production and prices. It seems clear that orders are not sufficient to support an advancing market for steel.

On the other hand, unfilled orders have attained a level which seems high enough to prevent much further weakening in steel prices. This fact, taken together with the

high as existed at the peaks of 1923 and 1924.

If the pig iron output is to be reduced, it will go far toward maintaining the price structure in the iron and steel industry. It must be observed, however, that back in February, 1923, there was a similar pause after which the upward trend was resumed. While, therefore, it seems probable that the upward trend has been definitely checked, it is too early yet to be certain.

A slight decrease in merchant pig iron stocks is indicated as of January 31, but the figures are undoubtedly larger than at any time during the period from August, 1921, to September, 1923.

The composite index of pig iron prices showed a slight increase for February, but has de-

maintained while in some cases the trend is clearly downward.

The prices at the two extremes appear to be the weakest,—sheets at the top and coke at the bottom, both show decided declines.

Billets and bars are holding steady.

The outstanding conclusion suggested by the picture shown in Fig. 3 is that a process of stabilization and readjustment is going on. A study of the trends suggests that pig iron will settle to a slightly lower level, thus restoring a more normal relationship both to coke on the one hand, and billets on the other. It looks like black sheets might work a little lower, which would put this product on a sounder basis with relation to bars. Wire nails (and rods) seem to occupy a logical



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*Oxygen purity a factor in welding and cutting economy.*—One half of one per cent increase in purity of oxygen said to make a saving of 11.9 per cent in oxygen consumption.—Page 823.

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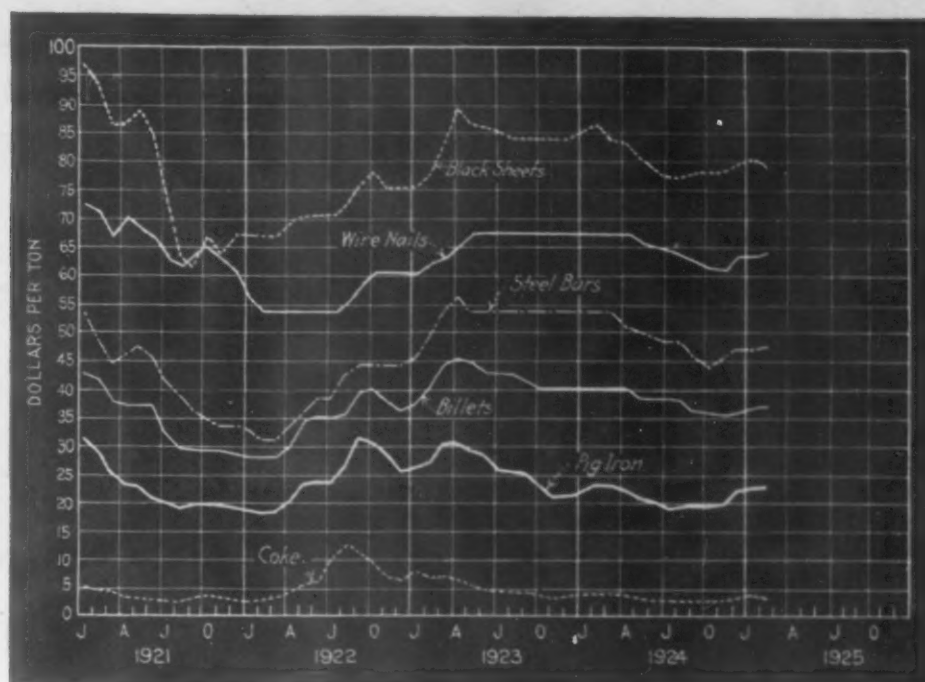
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**Fig. 3. Price Trends in Iron and Steel**

The prices shown are averages of the weekly quotations appearing in THE IRON AGE



position in the structure at present prices, but this assumes present levels for billets and bars.

The decline in scrap prices brings the market down about \$3.50 from the level which existed at the beginning of the year. This weakness in the scrap markets is significant, because, as everyone knows, scrap usually leads the way in the trend of iron and steel prices. There are exceptions to

this leadership, however, and it will be remembered that in September, 1919, and April, 1920, the markets for iron and steel did not follow the setback in scrap prices.

On the supply side overproduction has existed and recently this has been most apparent in the case of pig iron and a few special steel products, such as sheets. It seems reasonable to infer that the longer the present high rate of iron and

steel production is maintained, the more certain and the more extensive will be the sagging in the market.

At present the tendency appears to be to curtail production moderately. Assuming that this is to be the program, the logical outcome would be a relatively short period of irregular weakness in iron and steel markets followed by stabilization.

*The Iron Age, March 19, 1925*

## OPPOSE ENTRY OF FOREIGN STEEL

### Reinforcing Steel Organization Takes Action at Chicago Meeting—Large Gulf Imports

The danger of expanding shipments of steel from Europe was recognized at the first annual meeting of the Concrete Reinforcing Steel Institute held at the Drake Hotel, Chicago, March 10 and 11. Within the past six months, it is said, fully 30,000 tons of steel bars have been landed at Gulf ports at as much as \$10 below the domestic prices—more than ample to absorb the duty. The members of the association went on record that they would make no purchases of foreign steel and the president was authorized to appoint a committee of three to deal with the tariff committee at Washington on the subject and to approach state highway commissioners in the Gulf States and other portions of the country apt to be affected.

The Concrete Reinforcing Steel Institute had its inception in an organization meeting held at Pittsburgh late last year. The meeting last week at Chicago was the first regular annual convention and was attended by 50 representatives and officers of concrete bar companies from practically all parts of the country, including such distant points as Atlanta, Ga., Fort Worth, Tex., Kansas City, Mo., Omaha, Neb., and New York. The institute has been incorporated under the laws of Illinois and the following permanent officers and directors were chosen: President, W. H. Pouch, New York, president Concrete Steel Co.; vice-president, George E. Routh, Jr., Chicago, vice-president Kalman Steel Co.; treasurer, C. Louis Meyer, Omaha, president Concrete Engineering Co.; secretary, M. A. Beeman.

Directors include: James Cowin, president Cowin & Co., Minneapolis; W. B. Davis, general manager Knoxville Iron Co., Knoxville, Tenn.; P. J. Igoe, Igoe Brothers, Newark, N. J.; Gustave Kahn, Truscon Steel Co., Youngstown, Ohio; A. E. Lindau, president American System of Reinforcing, Chicago; C. Louis Meyer, president Concrete Engineering Co., Omaha, Neb.; W. H. Pouch, president Concrete Steel Co., New York; George E. Routh, Jr., vice-president Kalman Steel Co., Chicago; E. L. Ryerson, Jr., vice-president Joseph T. Ryerson & Son, Inc., Chicago.

Features of the meeting were addresses by G. E. Warren, assistant general manager Portland Cement Association, and A. E. Lindau, president American System of Reinforcing, Chicago. Mr. Warren outlined steps taken by his association to promote the further use of concrete. Mr. Lindau traced the production of new billet steel since 1910, together with the uses of rail steel and the possible curtailment in the future of the supply of rail steel owing to changing specifications on the part of the railroads.

### Production of Portland Cement

February output of Portland cement is reported by the Geological Survey at 8,255,000 bbl.—the smallest amount reported in more than a year. It compares with 8,916,000 bbl. in January and with 8,588,000 bbl. in February of last year.

Shipments in February are given as 6,015,000 bbl., the largest figure since November. This compares with 5,108,000 bbl. in January and with 5,933,000 bbl. in February of last year. It reflects the opening of active building construction.

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## Trade Associations

JUDGE GARY said something very apt years ago when he suggested, "Investigate the investigators." Last week Senator McKellar introduced a resolution calling on the Federal Trade Commission to report at the next session of Congress on the "open price associations." We are having that general sort of thing all the time. Congress investigates the trade commission, the commission investigates the associations, the Department of Justice brings suit against various bodies of men, these being essentially investigations that involve much trouble and expense to those who are called upon to defend themselves.

But in the other direction it is a case of "nothing doing." Nobody can inquire of the trade commissioner, or the Department of Justice, or Congress as to what it can do. Even the Department of Commerce failed to get satisfaction in its effort some time ago to develop a plain statement from the Department of Justice.

One may perhaps be able to fancy how Congress would feel if a trade association or collection of them should attempt to address an inquiry to that body as to what it wanted them to do and not to do. That, according to its notion, is not what Congress is for. Its function is to find out what people are doing, and then if it does not like it, enact laws to stop them. It is not in the congressional philosophy that anything should be done to encourage anybody to do anything. Occasionally there is a slip, but it is under pressure of constituents and not on the voluntary initiative of Congress.

The attitude is one of inertia. It is so easy to call for a report, and the more work it makes for somebody else, the better. It is bad enough for business men to have to grope along with only the guidance of the cases from time to time of things that are declared unlawful, without the constant menace that fresh laws will be enacted to go in turn through their long course of being interpreted. If Congressional "investigations" do not contemplate the enactment of additional laws, what are they for?

It is much as if one were expected to find his way through a forest not by following a blazed trail, but by avoiding all the trees that were blazed. Trade associations exist for the purpose of protecting capital investment and making it more effective in serving the public. That is not only a perfectly proper aim, but is a thing that is absolutely essential for the success of the country.

Free and unlimited price competition would be absolutely ruinous, because it would lead to the destruction of capital, since a large portion of all cost lies in overhead and free and unlimited price competition would ignore overhead, if not all the time at least for long enough spells to destroy capital. Who of the older generation does not remember the fears of "bankrupt competition" in the eighteen-nineties? One of the very useful activities of many trade associations is the setting up of correct and uniform accounting systems, whereby manufacturers may know precisely what their overhead is, so that they may allow for it. That is an eminently proper and useful thing to do, yet the activity is often called in question.

It would be reasonable, practical and constructive for trade associations and business organizations generally to investigate these investigators; that is, demand information from them, not of what they cannot do, but of what it is admitted they can do. That would be constructive and forward looking, while investigation in the other direction, from above downward, is destructive and intimidating.

OUTWARD expressions of hope that there would be no business boom but inward hoping that there would be the semblance of such in the particular case of each wisher—this mental attitude has been responsible in part for the questioning aired since late in January as to whether or not consumption has been actually real. Cold calculating analysis on the basis of economic facts has raised doubts that the recent high rate of production of iron and steel could be readily absorbed, but in the business analysis and forecast section of THE IRON AGE, contributed under the



auspices of the Bureau of Business Research of New York University, nothing has been said to justify any feeling that the volume of business will not be satisfactory as far ahead—several months—as any one properly dare to prophesy. In some respects the problem of the hour is not so much worrying over the rate of the continuing volume of business as the need of realizing we are in for a period of active competition, with all that this means in attention to selling and to economies in making as well as in distribution.

### Radio and the Industrial Small Town

**M**ANUFACTURERS whose plants are situated in small towns and villages in some degree remote from large centers of population have always in past years suffered the consequences of a surplus of idle time among their workers, especially in the winter months. The deadly ennui which comes to those having few intellectual resources, when they are cut off from contact with the crowd, breaks down morale and leads to troublesome discontent. Labor turnover runs high. Sometimes, when business is at its best, it is impossible to maintain working forces at their full quotas. Often it has been possible to trace serious strikes to this condition.

It was not many years ago when the mill town or village was drab and dreary enough through the long winter, with almost no amusements and no excitement excepting that which came from the saloon. The transition to better things began with the electric light, telephone and trolley car. Then came the automobile, now so universally owned, and the motion picture, which may be seen pretty much everywhere. The motor bus is a recent addition to the conveniences and luxuries of the modern industrial little town.

All these helped to make life in the country more cheerful, especially in the warmer months. But the problem of the northern towns was not yet solved. Ice and snow cut them off from easy communication with larger places. Now radio has done the trick, according to the experiences of men who have the management of mills and factories located in this class of community.

The experience of a manufacturer whose large factory is located in a somewhat remote New England village is typical. He asserts that the winter now passing developed an entirely new atmosphere among his employees and their families. Instead of being discontented, they have been happy, much happier, he believes, than the average of people of the same position in life living in the cities. In past years they were well cared for, in the effort to keep them contented. They had their club house, with frequent motion picture shows and dances and a good library. But winter seemed to get on the nerves of many of them. The young people would not stay, but migrated to the cities. Wives were unhappy. The undercurrent of unrest caused owners uneasiness. All this, according to this manufacturer, seems something of the past.

The town got the radio fever, in which it was no different from the rest of America. Those who could afford it, and some who could not,

bought sets. The plant employs many mechanics, and naturally the mechanical and scientific side appealed to them and they built sets of their own, and, these completed, built other sets for friends. The boys, of course, got deep into it. The women and children enjoyed the results. Evidently everyone in town had access to a nightly entertainment. They were in touch with the world, joining in the pleasures of the people of the cities for hundreds of miles about them. There was music for every taste, talks and lectures, time signals, market and crop reports and all the rest. The argot of radio was the common talk.

If the radio is serving to interfere with gatherings of idle, discontented talkers it is doing an inestimable good toward bettering the relations between employer and employee. And the economic influence thus exerted can hardly be exaggerated.

### An Indictment of Stupidity

**"SEE \$50,000,000 lost in copper men's tax by** high valuations. Couzens Committee experts base estimate on increases allowed above appraisals. Anaconda was assessed at \$188,713,192 after Bureau figured \$54,856,822." Thus ran a headline in the *New York Times* of March 9. The other dailies had the same story, headlined in about the same way. This without any doubt conveyed to the unthinking the idea that the copper mining companies had deliberately tried to defraud the Federal tax gatherers and got away with it; and that the Couzens Committee had shrewdly ferreted them out and might make them disgorge. Instead of anything of that sort, in fact the exposure is an indictment of the stupidity of Congress itself.

The uninformed but thoughtful reader may well have asked himself how a copper mining company could have played a trick on the Government by inflating its valuation, when at first sight the desire might have been the other way around; and why there should be such an enormous difference between corporate engineers and Government engineers.

The income tax law applying to 1919 provided not only for the taxation of true income, but also on capital gain as compared with value as of March 1, 1913. Irrespective of the merit or demerit of arbitrarily setting up that particular date, the mining companies represented to Congress that their net income was only in part true income, a large proportion being always the mere return of principal, inasmuch as a mine is a wasting asset. Congress, agreeing to this representation, inserted into the law a provision for depletion allowance. Then it became a duty between the Bureau of Internal Revenue and the mining companies to agree upon ways and means for estimating this.

Now it was to the interest of the mining company to fix as high a valuation as possible and avoid overestimating the period of probable extraction in years. In that way it would obtain the largest quotient and consequently the largest allowance for depletion. The interest of the tax gatherer was directly opposite. The result was

bound to be a compromise and a matter of agreement. The Couzens Committee has apparently dug up some of the tentative ideas of subordinate Government engineers which were subsequently rejected by their superiors. Such a difference in estimates as that between \$189,000,000 and \$55,000,000 is not preposterous in the light of such conditions as obtained with the Anaconda mines and the widely varying views that might have been taken in regard to them, according to whether they were academic and arbitrary on the one hand or bold, broad and commercial on the other hand. The Government, in short, made something of the nature of a bet with the mining companies.

With the lapse of a considerable period of years, both parties are beginning to get a better idea of how their bets are going to result. We know, in fact, of instances where mining companies have used up their depletion allowance without exhausting their mines. They did not set up a sufficiently high valuation and underestimated their life. In such instances the Government wins. The companies are constrained to keep on producing without any further allowance for depletion. In other instances the prospects stand more favorably for the companies. We say this without any reference to Anaconda or any other individual company, simply making the expression in principle. The Couzens Committee evidently has an idea of welshing on bets and playing the favorite governmental game of "heads I win, tails you lose."

Senator Couzens, who previously had an unfortunate experience with Secretary Mellon, appears to have a singular propensity for monkeying with buzz-saws. The day after he had thrown his last bomb the Bureau of Internal Revenue handed him a notice that it had revalued the stock of the Ford Motor Co. that he sold in 1919; and that instead of reckoning its worth on March 1, 1913, as \$9,000 per share, it now should be valued at \$2,500 as of that date, and would he please hand over \$10,000,000 as tax in conforming with the new assessment. Conceive the indignation that shook the senatorial toga!

It was the most humorous event of a day. The Senator was made the victim of the same kind of academic valuation with which he was trying to victimize the copper companies. However, it is thought that this instruction may have some effect upon Congress and lead it eventually to pass an income tax law that will be less stupid in its economics and less requisite of bureaucratic interpretation.

**G**ERMANY'S electric steel industry has apparently suffered but little as a result of the war. Detailed production data published in *Stahl und Eisen* show that the average annual output for the five years, 1919 to 1923, has been about 86,550 tons of ingots and castings. This compares with an output in 1913 of 88,880 tons. The best of the post-war years was 105,000 tons in 1922. Noteworthy is a marked decline in the amount of electric steel castings. For the five years this has been at the rate of only 12,200 tons per year as against nearly 24,000 tons in 1913. In the United

States electric steel castings have gained strikingly, the 1923 volume having been over double that of 1919.

### Employee Representation and Unions

**T**HE recent report of the Sage Foundation investigators in regard to the operation of the employee representation plan at the plants of the Colorado Fuel & Iron Co. is made the text of an article in the *American Federationist* by William Green, president of the American Federation of Labor. Although the report was mild in its praise of the Colorado or Rockefeller plan, which it described as only a partial success, Mr. Green objects to some of the statements made by the investigators, particularly the assertion that employee representation progress is a challenge to the trade union. He believes that exactly the contrary is true.

"Trade unions," says Mr. Green, "do not oppose shop committees when those committees are of their own making and which they control." He adds: "The company union functions only under the protecting shadow of the trade union, and the trade union—the bona fide union—challenges the authenticity of the artificial creation, the employee representation." In other words, if the shop committee or employee representation is absolutely controlled by labor unions, all is well. In the opinion of Mr. Green, if employers and employees try to get along without dictation, nothing worth while can be accomplished, but the truth is that domination of the union has meant not merely collective bargaining, but collective bulldozing, collective violence and virtually collective demand for restriction of output and often for unreasonable hours and wages.

The industry with which Mr. Green has been connected is a striking example of how ruin can be wrought by the complete domination of a labor union. The unions have so controlled large sections of the bituminous coal field that widespread unemployment and distress have been caused. Miners in droves and in train-loads have gone from the union to non-union fields in order to obtain employment, and even in the union itself members are urging the abandonment of the Jacksonville wage agreement, which has proved satisfactory to neither employers nor employees. Unless some way can be found to get out from the control of the miners' union, continuation of distressing conditions among thousands of miners is certain.

Instead of being an artificial creation, as Mr. Green asserts, employee representation is a natural development. It is, however, far from perfect. This was shown by the report in regard to its operations at the Colorado plants and more recently by a survey of over 100 Cleveland plants, principally in the metal-working field. This report shows that 16 companies have adopted employee representation plans and find them working successfully, but four other companies have discontinued employee representation. This is not a very large percentage of failure and, imperfect as employee representation is, it affords welcome relief to both employers and employees of many plants from intolerable exactions of labor unions.



## TUNNEL BIDS ASKED

### New York City Tunnel May Require 98,000 Tons of Cast Iron Segments—Bids Open May 8

The formal request for bids on the construction of the Narrows tunnel from Staten Island to Brooklyn, N. Y., has been issued by the Board of Estimate, New York. The present contract calls for bids on Sections 1, 2, 3 and 4, extending from Sixth Avenue and Sixty-fourth Street, Brooklyn, to the Baltimore & Ohio Railroad terminal at Arlington, Staten Island, with 10,400 ft. of tunnel construction under water. The total length of the tunnel between portals will be 5 1/3 miles. While the Narrows tunnel is smaller in circumference than the New York-New Jersey vehicular tunnel now under construction, it rivals the Hudson River tunnel in length under water, the latter being 9250 ft. long. Some 98,000 tons of cast iron segments will be required for the Narrows tunnel should it be shield driven. The Hudson River tunnel took 105,500 tons.

Specifications provide for bids on two types of construction with alternate on one. Shield driven, the tunnel would require 98,000 tons of cast iron segments, about 400 tons of structural steel, 3500 tons of bolts and 982,000 duct ft. of electric conduit.

The other type of construction provided for in the specifications, a trench tunnel, would require the dredging of 2,500,000 cu. yd. and include 439,000 cu. yd. of concrete, 23,500 tons of structural steel, 72,000 cu. yd. of tunnel excavation, 10,000 tons of cast iron segments and 586,000 duct ft. for electric conduit. An alternate bid on a four-track tunnel constructed by the trench method provides for 38,000 tons of structural steel.

The larger underwater tunnels in the United States have been mostly shield driven rather than trench tunnels. Of the tunnels in New York the Interborough Rapid Transit tunnel under the Harlem River was of trench construction. The Chicago tunnel at La Salle Street, 350 ft. long, twin bore, was built by the trench method, and there is a trench built tunnel of the Michigan Central Railroad under the Detroit River at Detroit, which is 2200 ft. long, twin bore.

## WOULD RESTRICT SEARCH

### Decision of Supreme Court Compared with Claims in Claire Furnace Co. Case

WASHINGTON, March 17.—The iron and steel industry has manifested considerable interest in the holding yesterday of the Supreme Court that the Federal Trade Commission has no right in the absence of prima facie evidence of violation of the law to compel search of books of business concerns. The ruling was handed down in connection with grain cases concerning Hammond W. Snyder & Co., Baltimore, and other grain interests. It was an affirmation of a decision in the American Tobacco Co. case in which the Supreme Court said the commission could not go on "fishing expeditions."

The principles in these cases are in some respects similar to those in the so-called Claire Furnace Co. case in which the commission has unsuccessfully sought cost and other data from 21 iron and steel companies. Attorneys who have studied the Tobacco company decision and the affirmation in the Grain case, however, point out that in the latter the commission itself sought examination of books on the strength of resolutions of Congress while in the Claire Furnace Co. case the commission sought to get data through questionnaires and no charge of violation of law has been made. Because of this it is held that the Tobacco and Grain cases are not entirely analogous to the Steel cases. Some attorneys express the opinion that the steel companies have a case even stronger than the Tobacco and Grain interests which were upheld in both lower courts and the Supreme Court of the United States.

### Production of British Empire Steel Corporation Large in Spite of Strike

SYDNEY, N. S., March 15.—In spite of the coal miners' strike, the British Empire Steel Corporation continues to expand operations at its steel plant here, with officials confident in the knowledge that there is sufficient coal in local banks to last for over two months, if the trouble in the coalfields should continue that long. Steel production has attained almost capacity. Two blast furnaces are supplying iron for the operation of 12 open-hearth furnaces. New production records have been set at blooming, wire and rod mills, and the working staff is now over 2000 and increasing daily. The tieup of the coal mines has had little effect on market prices for the three classes of stock. Executives of the company here indicate that the strike will be of short duration, due to the fact that the resources of the workers are greatly depleted. The attitude of the executives in Montreal has not expressed itself yet, but those in close connection with officials of the company feel that the British Empire Steel Corpora-

tion is unable to accept the terms of the miners, and that the mines will not be run at a loss.

The Trenton, N. S., works of the corporation have started working on orders for tie plates and other railway equipment for which the demand has increased of late. Work in the car shops is confined to the assembly of material with which to carry out the automobile car order for the Canadian National Railways.

### Will Develop Hydro-Electric Power

The State of Ohio has leased to W. H. Johnson, Middletown, Ohio, and to John R. Goudie, Cincinnati, the use of the Miami and Erie Canal for a distance of five and one-half miles from a point north of Middletown, to Excello, south of Middletown. The lease, which is for 25 years, includes the use of the water and of the right of way and is subject to renewal for the same period. It also includes the use of the canal right of way from Excello to Hamilton for constructing a system of poles and wires. Plans for hydro-electric power development by the lessees call for construction of three generating plants in or near Middletown, these units to be controlled by a headquarters and central distributing plant in Middletown. The units will be built, according to report, by the General Electric Co. and the turbines will be installed by the James Leffel & Sons Co., Springfield, Ohio.

### Slight Increase in Mill Operations in the Youngstown District

YOUNGSTOWN, March 17.—Steel plant schedules this week in the Mahoning Valley register moderate deviations from preceding weeks, mainly in the direction of enlargement in production. The Youngstown Sheet & Tube Co., Trumbull Steel Co. and Newton Steel Co. contribute to broader output in the sheet mill division, having increased the number of their active mills. Of 127 sheet and jobbing mills in the Valley, 109 were scheduled for operation at the beginning of the week, a production rate approaching the best previous level of the year.

The Sheet & Tube company has a number of sheet mills at its Brier Hill works under power this week; the Trumbull company is completing repairs to a motor, enabling the resumption of units forced into idleness; the Newton company has added two additional mills at its Newton Falls plant, Trumbull County, to its active units, for a total of 16, of 20 in the complement. For several months the Newton company has been operating but 14 mills.

In this district the Sheet & Tube company has 27 sheet mills in action; the Republic company, 14; Thomas Sheet Steel Co., 10; Falcon Steel Co. and Mahoning Valley Steel Co., eight each, and Waddell Steel Co., four.

## Record Year for United States Cast Iron Pipe and Foundry Co.

President N. F. S. Russell of the United States Cast Iron Pipe & Foundry Co., referring to operating conditions in 1924 as unusually satisfactory, labor conditions being much better, told stockholders that the outlook for 1925 is promising. Net profit in 1924 was \$6,020,920, compared with \$3,471,268 for 1923. This establishes a new record in product made, sold and shipped by the company, as well as in net profit. Mr. Russell said:

"The balance sheet shows a net increase in property and plant account of \$491,039. During the year additional construction was completed at Birmingham, as well as replacement of buildings destroyed by fire. A new pattern shop and pattern storage building is being constructed at Scottdale. The sand cast shop at Birmingham, making pipe of large diameters, which has operated but a few months in the last 13 years, has been repaired, and will shortly be prepared to start manufacturing, should the sale of pipe in diameters of 20 in. and larger exceed the present capacity of operating pits; or should the demand be less, it might be economy to operate this shop in connection with the sizes made in this plant by the deLavaud process, and close down some other plant.

"The outlook for 1925 business is encouraging, and the company enters upon the year with satisfactory tonnages booked at fairly remunerative prices, although the competition of France and other European countries has had an adverse effect on prices. It is hoped, however, as the money of these competing countries stabilizes in value and their wages more nearly approach the scale of wages paid in the United States that their costs and selling prices will compare somewhat more closely with the costs and selling prices of this country.

### Plants Well Maintained

"During the year \$2,470,885 has been expended for repairs to buildings, upkeep of machinery, equipment, tools, etc. All plants have been maintained and are in a position to continue operating to present capacity on sand cast pipe. Reserves have been maintained, and there has been charged into operating accounts and credited to various reserve accounts during 1924 the sum of \$584,634.

"Current assets were placed at \$13,564,534, against current liabilities of \$2,012,055."

## French Production of Iron and Steel in January

PARIS, FRANCE, March 6.—In January France produced 669,352 tons of pig iron, against 665,326 tons in December, of which 125,433 tons were foundry pig iron, (134,404 tons in December), and 495,288 tons of basic pig iron, (477,429 tons in December). There was 608,146 tons of raw steel (605,122 tons in December), of which 592,630 tons were ingots and 15,516 tons castings. The total output can be divided into 416,347 tons of basic steel, (400,323 tons in December), and 175,709 tons of open-hearth steel, (189,440 tons in December).

During January France did not export pig iron to the United States; but delivered 49 tons of rolled iron and steel in blooms, billets and bars, etc.; and 319 tons of rails. These figures are from the official statistics of the French Customs.

The Mystic Iron Works, Boston, has placed additional contracts for equipment for its Everett, Mass., blast furnace plant: 55-ton ladle crane, Cleveland Crane & Engineering Co., Wickliffe, Ohio; six super heaters, Super Heater Co., Youngstown, Ohio; skip and conveyor to handle coal for the boiler plant, to C. O. Bartlett & Snow Co., Cleveland; and a cinder car, William B. Pollock, Youngstown. Fair progress is being made in the construction of the company's new plant, although contractors are somewhat behind schedule, due to weather conditions the past two months.

## Sheet Production in February Again Exceeds Sales and Shipments

The sheet steel industry still has a tendency to produce more heavily than is warranted by sales or specifications and the weakness of the market not only recently, but previously, usually is traceable to that tendency. In the face of sales equal to only 83.1 per cent of capacity and of shipments that are placed at 89.8 per cent of capacity, independent manufacturers reporting to the National Association of Sheet and Tin Plate Manufacturers last month had a production of 283,200 net tons, which was 96.5 per cent of capacity. The January record was: production 98 per cent of capacity, sales 74.4 per cent and shipments 87.6 per cent. For the third month running sheet sales showed a loss as compared with the previous month in February. Shipments which ran up in January fell off again in February. Unfilled orders continued to decrease and those as of Feb. 28, were almost 100,000 tons smaller than at the end of December last.

The report for February compares with those of the two previous months and the same month last year, figures in net tons, as follows:

	1925		1924	
	Feb.	Jan.	Dec.	Feb.
Number of mills...	701	701	701	679
Capacity .....	386,400	428,600	422,600	392,000
Per cent reporting.	73.5	75.6	74.4	72.7
Sales .....	235,980	241,040	350,868	189,091
Production .....	283,290	317,424	259,794	275,118
Shipments .....	255,080	283,645	229,573	249,859
Unfilled orders...	565,133	607,190	663,460	434,145
Unshipped stocks...	105,994	91,363	85,856	82,362
Unsold stocks....	53,717	49,460	45,743	30,658

## Trying to Stabilize the Semi-Finished Steel Market at Youngstown

YOUNGSTOWN, March 17.—Major sheet producers, who are also makers and sellers of sheet bars, are endeavoring to stabilize the semi-finished steel market, and are attempting to adjust contracts with non-integrated sheet rollers, covering next quarter deliveries, on a higher basis. During the first quarter, most of the smaller sheet interests in this territory, obliged to purchase their semi-finished steel requirements, secured sheet bars at \$37.50 per ton. Producers are attempting to establish the second quarter price at \$39, believing that in so doing, rollers dependent upon the open market for their supplies, will be less inclined to cut under the market in accepting sheet contracts.

The wire rod market is especially firm in this district, and the Youngstown Sheet & Tube Co. is reported sold out on rods until July 1. Its own wire mills are working virtually at capacity, taking the bulk of its rod production, but there is a substantial merchant demand at the same time. Prices range from \$48 to \$50 for wire rods. Requirements for light reinforcing rods are growing.

Leading producers in this area report that specifications for finished steel show more strength the past ten days. They declare that consumers, especially motor car manufacturers, who have been attempting to break the market, have failed, and that business is going forward at levels which have prevailed for some time.

Better buying from the motor industry is accelerating the demand for highly finished sheets, strips, merchant steel bars and the ordinary grades of sheets.

Wire products and strip steel are in firm demand, while tin plate capacity is operating full.

## Large Swedish Iron and Steel Production

Swedish iron and steel production considerably increased last year. Home demand has been much higher and imports increased from 187,800 to 291,000 tons, while exports advanced only from 232,000 to 262,000 tons. The 1924 iron and steel production was as follows, in metric tons:

	1924	1923
Pig iron (including castings)...	507,800	282,600
Open-hearth steel .....	398,400	217,900
Bessemer and mild steel.....	63,700	35,100
Electric steel .....	33,400	17,700
Rolled material .....	330,700	200,300



### New Universal and Tool Grinder

A recent addition to the line of Ohio machine tools of the Oesterlein Machine Co., Cincinnati, is the universal and tool grinder here illustrated. The machine is designated as the No. 2-L and is intended primarily for use in railroad and automobile shops, for the grinding of gang reamers, boring bars, bridge reamers, taps and similar tools. Large capacity, versatility of application and rapid manipulation are features.

The capacity of the machine is 30 in. between centers. The swing is 9 in. and the vertical adjustment is



In Addition to Arrangements for Tool Grinding, Attachments for Cylindrical, Internal and Surface Grinding May Be Used

7½ in. The machine is of the milling machine type of construction. Planer type bearings are used on table and saddle.

The table reciprocation may be obtained by hand-wheel, for which there are two gear ratios and, in addition, a ball-bearing lever feed is provided. The lever feed may be engaged at any point so that the operator may use his right or his left hand for table reciprocation. This ball bearing lever feed has also been added to the company's Nos. 2 and 3 grinders.

The wheel spindle may be set parallel to the table for plain wheels, or at right angles to the table for cup wheel grinding. In addition to tool grinding, attachments for cylindrical, internal and surface grinding may be used.

### Increased Number of Employees of Bethlehem Steel Corporation Apply for Shares

Bethlehem Steel Corporation announces that 22,400 of its employees have applied for a total of 46,766 shares of its 7 per cent cumulative preferred stock offered at the price of \$100 per share in response to the second annual offering under its employees savings and stock ownership plan. This compares with 19,922 employees applying last year for a total of 51,034 shares offered at \$94 per share. The application will be filled from stock already issued and outstanding.

The employees applying this year constituted about one-third of the total number of employees. The applications averaged slightly over two shares each. The total number of shares applied for this year is about 10 per cent of the total shares of the 7 per cent preferred stock outstanding, and for the two years applications have been made for almost 20 per cent of the total shares outstanding.

The stock sold under Bethlehem Savings and Stock Ownership Plan may be paid for in installments at the rate of \$4 a month per share, which may be deducted from earnings. On this basis they will be paid for in full in twenty-two months. In the meanwhile dividends are credited to the employees and interest charged on

the unpaid balance at the rate of 5 per cent. As an inducement to retain their shares and remain in the employ of the corporation, further payments totalling \$15 per share will be made or credited to employees at the rate of \$1 for the first year, \$2 for the second year, and so on up to \$5 for the fifth year for each share of stock held.

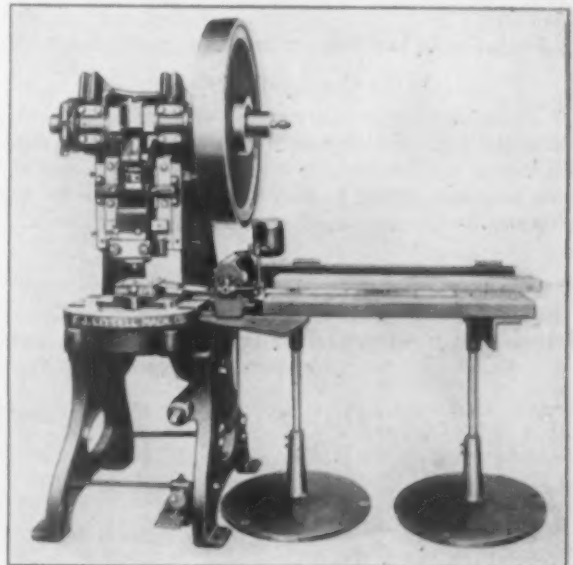
### Removal of Red Stains from Brass

Various considerations affecting the oxidation and staining of brass are reviewed in a paper, "The Removal of Red Stains from Brass," by E. A. Bolton, presented at the annual general meeting of the Institute of Metals, in London on March 11. The author's earlier work is confirmed and, in addition, the difficulty of avoiding staining with brass of high-copper content is described. The theory of staining occurring by reaction between cupric oxide and the pickling acid is described and attributed to concentration cell action. Electrochemical difficulties in stain removal are shown. Attention is turned to the use of solutions containing sulphuric and nitric acids for stain removal. While such solutions show some possibility of success, results are not so favorable as those obtained with solutions of dichromate and sulphuric acid. The action of these solutions is explained and described in detail and as a result of the research, details are given suitable for the development of the process industrially.

### Combination Stock Table and Oiler

Compactness is a feature of the combination stock table and oiler illustrated herewith, which has been placed on the market by the F. J. Littell Machine Co., 4127 Ravenswood Avenue, Chicago. The device is adjustable to any height of press and can be inclined at any angle. Because of the heavy bases it does not have to be bolted to the floor, but can be moved to any press where it may be required.

The oiling attachment oils the stock on the top and bottom. It is claimed that by oiling the stock in this



The Table May Be Adjusted To Any Height of Press and Can Be Inclined At an Angle. The oiling attachment oils the stock on the top and bottom

way the dies operate from two to three times longer without sharpening than when stock is oiled in the usual way by means of a brush, on one side only. It is also claimed that operators' productive time is lengthened, as it is unnecessary to spend time in applying the oil with a brush.

The Bethlehem Steel Co., Bethlehem, Pa., has placed an order with the Pittsburgh Electric Furnace Corporation, Pittsburgh, for an electric furnace to be used in one of its Pennsylvania plants.

# European Iron and Steel Markets Weaker

Deadly Dullness in England—Germany Marking Time  
on French Negotiations—Belgian  
Situation Poor

(By Cablegram)

LONDON, ENGLAND, March 16.

**P**IG iron is dull, with prices unchanged, but concessions probably are obtainable on decent offers. Consumers in domestic and export markets are showing little interest except in small, prompt parcels of foundry grades. Two Midland furnaces have been blown out. Scotland is contemplating further curtailment. Hematite business is poor and stocks are accumulating, but makers are unable to accept buyers' bids.

Foreign ore is dull. Bilbao Rubio is held nominally at 22s. 6d. to 23s. (\$5.39 to \$5.50) c.i.f. Tees.

Finished steel is quiet, with very little fresh buying of heavy sections. Makers assert that further concessions are impossible, owing to high costs.

February exports of pig iron amounted to 40,449 tons, of which 9656 tons went to the United States. Total exports of iron and steel amounted to 298,761 tons.

## Sheets and Tin Plate

Tin plate demand has improved slightly, with further sales made, but makers generally are in want of orders. The stabilization scheme has been fixed until October, with the minimum price 23s. 1½d. (\$5.53) basis, IC, f.o.b., subject to alteration at any time.

Galvanized sheets are deadly dull. The mills are short of orders but are not keen to grant further concessions.

Black sheets are dull, with prices unaltered.

## On the Continent of Europe

Continental markets are quiet, with prices generally easier and little business passing through traders here. Consumers are declining to commit themselves for forward business, owing to uncertainties as to prices and deliveries.

In France the fixing of minimum prices has been begun by the makers' federation, styled "Office des Statistiques des Produits Metallurgiques."

In Germany uncertainty is apparent owing to the protracted character of the commercial negotiations with France. The Phoenix Düsseldorf Rohren und Eisen Walzwerke is discharging 750 men, but most makers are well occupied.

In Poland the plan to form a cartel of Upper Silesian and "Congress" Polish ironmasters has failed.

## COMBINATIONS IN GERMANY

Trade Organizations Hold Limelight—Iron and Steel Syndicates, Conventions and Other Selling Organizations Developing

BERLIN, GERMANY, Feb. 27.—The new Luther Cabinet is pursuing a policy which, on the whole, strongly favors the industrial and commercial interests, and shows less concern for the interests of the consumer. It has submitted to the Reichstag a financial reform in which taxes on business transactions are heavily reduced, while the direct taxation burden is changed little, and it is preparing bills imposing new indirect tax burdens. The commercial treaty negotiations with France, which seemed about to break down, have now practically led to a provisional settlement, but whether the proposed arrangement to accept annually a fixed quantity of French iron will be put through is not yet known.

Business on the whole is better. The unemployed on Feb. 1 numbered 591,667, against 535,529 on Jan. 1, but the causes of this increase have now ceased. Berlin industries, particularly the metal branches, report a great improvement in the last few weeks. After a brief improvement renewed stagnation has overtaken the coal market. Far more coal has been of late pro-

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.78 per £1, as follows:

Durham coke, del'd..	£1 4s.	\$5.74
Bilbao Rubio oref...	1 2½	5.38
Cleveland No. 1 fdy..	4 3	19.84
Cleveland No. 3 fdy..	3 18	18.64
Cleveland No. 4 fdy..	3 17	18.40
Cleveland No. 4 forge	3 16	18.16
Cleveland basic .....	4 0	19.12
East Coast mixed....	4 5	20.32
East Coast hematite..	4 19	23.66 to \$23.90
Ferromanganese .....	15 0	71.70 to 74.09
*Ferromanganese .....	15 0	71.70 to 74.09
Rails, 60 lb. and up..	8 10	40.63 to 43.02
Billets .....	7 2½	34.06 to 38.24
Sheet and tin plate		
Bars, Welsh .....	7 17½	37.64
Tin plates, base box..	1 2½	5.29 to 5.44
Ship plates .....	9 0	1.92 to 2.03
Boiler plates .....	13 0	2.77 to 2.88
Tees .....	8 17½	1.89 to 2.00
Channels .....	8 2½	1.73 to 1.84
Beams .....	7 17½	1.68 to 1.79
Round bars, ¾ to 3 in.	9 2½	1.95 to 2.05
Galv. sheets, 24 gage	16 5	3.47 to 3.57
Black sheets, 24 gage	12 0	2.56 to 2.61
Black sheets, Japanese		
specifications .....	15 5	3.25
Steel hoops .....	10 15 and 12 10*	2.29 and 2.67*
Cold rolled steel strip,		
20 gage .....	16 0	3.41

\*Export price.

†Ex-ship, Tees, nominal.

## Continental Prices, All F. O. B. Channel Ports

Foundry pig iron:(a)		
Belgium .....	£3 15s.	\$17.93
France .....	3 15	17.93
Luxemburg .....	3 15	17.93
Basic pig iron:(a)		
Belgium .....	3 14	17.69
France .....	3 14	17.69
Luxemburg .....	3 14	17.69
Billets:(a)		
Belgium .....	5 4	24.86
France .....	5 4	24.86
Merchant bars:		
Belgium .....	5 14	1.22
Luxemburg .....	5 14	1.22
France .....	5 14	1.22
Joists (beams):		
Belgium .....	5 9	1.16
Luxemburg .....	5 9	1.16
France .....	5 9	1.16
Angles:		
Belgium .....	5 18½	1.26 to 1.28
½-in. plates:		
Belgium .....	6 19	1.48
Germany .....	6 19	1.48
¾-in. ship plates:		
Luxemburg .....	6 19	1.48
Belgium .....	6 19	1.48

(a) Nominal.



duced than can be sold. The mild winter and competition from lignite and oil have combined to injure the selling market. The coal crisis must be considered chronic. Experts hold that only a very great increase in industrial activity, or some entirely unforeseen factor, can again bring the demand for coal into right proportions with the supply.

#### Cooperation Rampant

Syndicate construction is proceeding. The future of the Tubes Syndicate may be considered assured, all producing concerns having signed the agreement. The Tubes Syndicate, like the Semi-Finished Materials Syndicate, is a selling organization. It will begin operations on March 1. Negotiations are proceeding with the Czechoslovak tubes concerns, to confine them to their natural selling districts, on condition that, should they fail to dispose of their output, they will be compensated by the German syndicate. As, with exception of the Mannesmann and Hahn companies, Czechoslovakia's tubes works are not important, it is hoped to conclude the arrangement immediately.

Formation of the Wire Rod Syndicate has been retarded by opposition of opinion, connected with the question whether the new Raw Steel Syndicate will be prolonged definitely for five years or not. This question will probably be settled early in March. The twist drill producers have formed a new price convention, which most of the larger concerns have joined. Severe penalties will be imposed for selling in violation of the convention's conditions. The iron trading interests have been negotiating at Düsseldorf with the aim of effecting simplification and economy.

Statutes of a Thick Sheets Syndicate have been drafted. The Bar Syndicate has not yet been formed. The trend toward combination is checked by disputes as to the relative merits of syndicates as compared with "conventions" for mere regulation of prices and selling conditions, also as to whether, if the syndicate form is chosen, those firms which have their own selling organizations shall be compelled to sell in future through the syndicate. Difficulty is met with also in reconciling the claims of individual concerns to over-large "quotas" in the combined production of the syndicates.

#### Steel Concerns Busy

The steel market is quiet, but orders are adequate; and foreign orders have even been lost through the inability of works to deliver within the required term. Companies which have not sufficient orders to make up their production quotas are allowed to sell their unexercised rights to other concerns, the usual price paid being 5 gold marks per ton. Krupps, the Phoenix Co. and the Gutehoffnungshütte all have bought portions of other companies' quotas.

Domestic business is more satisfactory than export business. Sales to Russia and to the Far East are insignificant. Big orders from the new Railroad Corporation (former Federal Railroads) are expected. In the second half of January the market for machine tools suddenly improved, and prices for first-quality goods were raised 10 per cent. Export in this branch is increasing. Large orders have been received from South America, East Asia and North Europe; and there has been some improvement in business with Italy and Spain. In other kinds of machinery the export market is weaker.

Industries which consume sheets complain of too high home prices and too long delivery terms; and they have published a protest against plans to protect the producers further by means of increased import duties.

Prices have somewhat weakened. The scrap market led, latest rates per metric ton being: steel scrap 73 to 74 marks (\$17.66 to \$17.90 per gross ton), solid scrap (Kernschrott) 71 marks (\$17.18), cast iron scrap 78 marks (\$18.88). In mid-February the Pig Iron Syndicate decided to increase prices by not more than 2 marks per ton (48c.). At home pig iron is in demand, but the foreign market is weak. The Siegerland Iron Ore Syndicate has decided to retain its present prices unchanged throughout March. The price of bars has dropped by 5 to 7 marks a ton (\$1.21 to

\$1.69) from its highest level of this year. Rates per metric ton ex-works in the last week of February were:

	Marks	Equivalent Per Gross Ton
Blooms .....	112.50	\$27.23
Billets .....	120.00	29.04
Slabs .....	125.00	30.25
Wire rods .....	140 to 142	\$33.88 to 34.36
		Per Lb.
Bars .....	133 to 135	1.44c. to 1.46c.
Construction forms .....	130	1.40c.
Universal iron .....	150	1.62c.
Bands .....	165 to 167.50	1.78c. to 1.81c.
Thick sheets (over 5 mm.) .....	145 to 155	1.57c. to 1.67c.
Medium sheets (3 to 5 mm. or No. 11½ to 6½ gage) .....	180 to 185	1.95c. to 2.00c.
Thin sheets (1 to 3 mm.) .....	220	2.39c.
Thin sheets (under 1 mm. or No. 19½ gage) .....	235	2.54c.
Drawn wire, bright .....	185	2.00c.
Drawn wire, galvanized .....	230	2.49c.

## BELGIAN STEEL MARKET WEAK

Prices Lower and Costs Troublesome—Sheets in Better Demand Than Other Items

ANTWERP, BELGIUM, Feb. 25.—Business in steel gets worse; the steel market is weak and without action. Prices in general show depressed tendencies. The position taken by buyers indicates clearly that they rely on further price reductions. Makers are not without anxiety for the near future, especially as information from English markets shows continual dullness. Prices are lower, nearly as low as last November, when they were considered at bottom. The big works are still well provided with orders. The smaller works, also converters, are unfortunately more affected by the crisis which, so far, has principally remained commercial.

**Finished Steel.**—Bars are obtainable from makers at £5 15s., being \$27.30 (1.24c. per lb.), f.o.b. Antwerp, this for large business and favorable specifications. Belgian consumers will have to pay up to \$28 or 1.27c. (560 fr.). The lowest price reported for beams is £5 9s. for normal sections, i.e., \$25.90, or 1.17c.; f.o.b. Antwerp, with up to £5 12s. (1.20c.) for other sections. Makers, notwithstanding the general resistance of buyers, do not intend to go lower. The market for this class of material remains more than ever fully depressed. Rods and wire rods, also, are weak. On the other hand, hoops are well asked for and maintain their previous prices. Prices for steel are approximately as follows:

	Fr.	Per Lb.
Bars .....	550 or \$27.50	(1.25c.)
Beams .....	520 or 26.00	(1.18c.)
Rods .....	645 or 33.85	(1.54c.)
Corrugated bars .....	420 or 31.00	(1.41c.)
Hoops .....	750 or 37.50	(1.70c.)
Cold rolled steel hoops .....	1,040 or 53.00	(2.40c.)
Drawn steel: squares .....	975 or 48.75	(2.21c.)
rounds .....	950 or 47.50	(2.15c.)
hexagons .....	1,050 or 52.50	(2.38c.)
Spring steel .....	1,025 or 51.25	(2.32c.)
Rails .....	650 or 32.50	
Wire rods .....	670 or 35.00	

Luxemburg and Lorraine works quote nearly the same prices except for beams, where Lorraine makers quote in many cases 1s. (24c.) lower. This competition is sufficiently strong to be considered.

**Sheets.**—Prices for sheets, without being firm, are most nearly so. Most of the makers have still plenty of work. Heavy sheet quotations are maintained at £7 and £7 2s., f.o.b. Antwerp. Lower prices may, however, be met, as Lorraine and German works quote, it is reported in certain cases, somewhat lower. Approximate prices are:

	Fr.	Per Lb.
Thomas sheets, ½ mm. (No. 25½ gage) .....	1,140 or \$57.00	(2.59c.)
Thomas sheets, 1 mm. (No. 19½ gage) .....	1,000 or 50.00	(2.27c.)
Thomas sheets, 2 mm. (No. 14 gage) .....	800 or 40.00	(1.81c.)
Thomas sheets, 3 mm. (No. 11½ gage) .....	720 or 36.50	(1.66c.)
Thomas sheets, 5 mm. (No. 6½ gage) .....	670 or 35.00	(1.59c.)
Galvanized sheets, ½ mm. ....	2,250 or 112.50	(5.10c.)
Galvanized sheets, 1 mm. ....	1,700 or 85.00	(3.86c.)
Average price for polished sheets .....	1,540 or 77.00	(3.45c.)

Light material is available in large quantities. Prices for this class are much easier. Furthermore, French works seem to be in the same situation and are giving Belgian producers strong competition.

**Iron.**—Business for iron commodities is scarce and the market is weak. Some works have closed down. In fact, on account of the prices of scrap, costs are too high to attract business. Quotations are:

Commercial iron No. 2.....	Fr. 580 or \$29.00
Commercial iron No. 3.....	600 or 30.00
Commercial iron No. 4.....	625 or 31.25

f.o.b. Antwerp. The quoted sterling price is on the basis of £6 5s.

**Pig Iron.**—Phosphoric foundry pig iron with 2.5 to 3 per cent Si. is quoted 350 to 360 fr., f.o.b. Antwerp, i.e., \$17.50 to \$18. Deliveries are prompt. The inland demand is not strong. Notwithstanding this, prices are maintained well. Luxemburg makers quote the same prices but French makers, even for export, are demanding much higher prices. The latter find just now a better outlet for their material in their own country and in Italy. Belgian semi-phosphoric pig iron is not being

made; this quality of pig iron is, however, offered at rather cheaper prices by German and, in some cases, by French furnaces.

**Semi-Finished Material.**—This is still quoted high. Prices asked by Belgian makers are not low enough to permit business with English importers, nor other business proposed from abroad. The reason is that our makers have nearly no spot material. Belgian prices at which business is accepted run about £5 6s. for billets, with £5 10s. for targets. Most probably, with firm business in hand, these prices could be shaded by 1s. per ton. Nominal prices are:

Thomas billets .....	Fr. 500 or \$25.00
Thomas blooms .....	480 or 24.00
Thomas targets .....	520 or 26.00

Scrap is weak. Prices are lower. Business is absent. Foundry scrap (first choice) is dearer than foundry pig iron. Quotations are:

Mass .....	Fr. 300 or \$15.00
Open-hearth .....	290 or 14.50
Blast furnace .....	270 or 13.50
Drillings .....	220 or 11.00
Foundry .....	370 or 18.50

## FRENCH CONDITIONS FAVORABLE

### Orders in Hand for Several Weeks—Future Somewhat Uncertain

PARIS, FRANCE, March 6.—Although the market was favorably impressed in consequence of the better outlook of the Franco-German negotiations, inland demand is far from active. In export markets the depreciation of French currency, in comparison with both British and Belgian money, does not appear to have much affected inquiry, which remains limited. Moreover the Germans, acting under cover of their customs tariff, have taken again to dumping, though this is prohibited by the Treaty of Versailles. In this way they obtained orders for \$50,000 of mechanical plant for Uruguay, for several million marks of textile plant for Russia and for locomotives for Egypt.

The home situation is marked by uneasiness and uncertainty as to the future. The French industrials, in consequence of the finance bill, just voted by the Chamber of Deputies, have now a foretaste of what is lying in store for them in the way of fiscal charges, at a time when coke has risen and when a continuous soaring of living costs means, in the very near future, claims for wage increases. These are no doubt the principal factors preventing the recently formed producers' "ententes" from exerting upon the French market the expected influence for the better.

**Coke.**—During February the Ruhr has sent the ORCA 323,425 tons of coke, an average of 11,600 tons per day. This proves that the Germans are not short of coke. For these indemnity deliveries are paid 24 gold marks (\$5.81 per gross ton), while they sell in export or home markets at 20.50 or 21 gold marks (\$4.96 to \$5.08). In the three first days of March the deliveries amounted to only 28,772 tons.

On demand of the French government indemnity coke is raised by 4.25 fr. per ton as from March 1; the price, on truck at Sierck, is now 143.65 fr. (\$7.57) plus 0.50 fr. for general expenses of the ORCA. An increase will come in the near future when the production tax comes into play; this will amount to about 2.60 fr. (14c.) per ton. The contribution of 5 fr. per ton of coke for the Mutual Insurance Funds has been suppressed.

**Pig Iron.**—The situation is, on the whole, satisfactory; demand is good and prices stable, though with a tendency toward a rise. In this department, the producers' entente appears to have a favorable result. The basis price of 335 fr. (\$17.65) is often exceeded up to 338 to 340 fr. (\$17.80 to \$17.92). For export, foundry iron is in good position, Belgian and Luxemburg prices being identical: i.e., 340 to 345 fr. French (\$17.92 to \$18.18); 350 fr. Belgian (\$17.95); or 77s. to 79s. (\$18.33 to \$18.80), f.o.b. Antwerp, according to grade. Not much tonnage is available in basic iron,

although the great output of this grade is noticeable. An entente is being tried in hematite iron, but nothing is settled so far. The average price is around 430 fr. (\$22.65), yet in the Center one can find iron at 425 fr. per ton (\$22.40), and elsewhere (South and North) 440 to 450 fr. (\$23.20 to \$23.70).

**Semi-Finished Products.**—Situation favorable; the works are busy for two or three months to come; the prices are firm within the terms of the entente, viz.: blooms, 420 fr. (\$22.13), basis; billets, 440 fr. (\$23.20), basis; targets, 450 fr. (\$23.70), basis in basic steel, with an increase of 50 fr. (\$2.63) per ton for open-hearth steel. For export, hardly anything but billets is being sold by Lorraine, and Luxemburg offers targets; prices are stable and rather above the basis of the entente at £5 to £5 2s. (\$23.80 to \$24.28) for blooms; £5 4s. to £5 5s. (\$24.75 to \$25) for billets; £5 7s. 6d. to £5 8s. 6d. (\$25.58 to \$25.82) for targets, f.o.b. Antwerp.

**Rolled Steels.**—The situation of this market is perhaps less satisfactory than the preceding ones. Demand is dull; nevertheless the mills are well booked with orders for several weeks forward; the basis established by the entente is stable at 500 fr. (1.18c. per lb.) for beams; 530 fr. (1.25c.) for merchant steel. But these prices are valid only for orders of 50 and 100 tons; for orders going from 20 to 50 tons, there is an increase of 5 fr.; from 10 to 20 tons, an increase of 10 fr.; for orders under 10 tons, an increase of 20 fr. A decrease of 2.50 fr. to 10 fr. per ton may be had for orders above 500 tons to one destination. Steel for bolts is fixed at 550 fr. (1.30c.); hoops at 680 fr. per ton (1.60c.). For export, the situation is depressed in consequence of slack business and feebleness of the British market. As a result, competition is extremely active and prices are coming down at £5 7s. 6d. to £5 10s. (1.14c. to 1.17c.) for beams; £5 12s. 6d. to £5 14s. (1.19c. to 1.21c.) for merchant steels.

**Sheets.**—For heavy sheets, the position is still very difficult: 65 to 67 fr. (1.53c. to 1.58c.) are quoted and, in certain cases, even 64 fr. (1.51c.); boiler sheets are, in the North and East, at 74 to 76 fr. (1.74c. to 1.79c.) at works; in the Center, 90 to 100 fr. (2.12c. to 2.35c.); medium sheets vary from 86 to 88 fr. per 100 kg. (2.02c. to 2.07c. per lb.). The position of light sheets fluctuates; the average price ranges from 100 to 105 fr. (2.35c. to 2.47c.) at works. For export, competition has arisen anew with Belgium, Germany and Luxemburg for heavy sheets; as a result, prices have decreased to £7 and even £6 19s. (1.49c. and 1.48c.). In Luxemburg heavy sheets are quoted 63 to 65 fr. Belgian (1.44 to 1.49c.) at plant; the medium sheets are quoted at 66 and 68 fr. (1.51c. to 1.56c.).

**Wire Products.**—Wire rods are firm at 60 to 63 fr. (\$31.60 to \$33.20) with steady arrival of orders, as well from home markets as for export, where the quotation is £7 (\$33.32).



## EUROPE COMPETES IN FAR EAST

Belgium Offers Bars and Shapes at Low Prices—

British Tin Plate and Sheets Lower

NEW YORK, March 17.—Export markets are generally quiet, even the Far East having settled into a condition of dullness. Chinese purchasers are still unwilling to meet the American quotations on second-hand material and much of the business being transacted in new products is apparently going to European sellers. This is also true of Japanese business. Belgian bars are understood to have been sold at as low as 1.70c. per lb., c.i.f. Japanese port, while the lowest reported quotation on bars by American mills was about 2.15c. per lb., c.i.f. Japan, or about 1.60c. per lb., Pittsburgh. The low quotations of French and Belgian mills to South American buyers seem to be attracting more and more of this business, while German sellers are competing rather successfully for Cuban business.

Low prices are extending to black sheets and tin plate, in which the United Kingdom makers are the principal competitors of the American sellers. British mills are understood to be quoting \$88 on light gage black sheets, while American mills are holding to a range of \$91 to \$93 per ton, c.i.f. Japan. The leading export interest in the United States is now quoting on black sheets for Japan, packed 13 to the bundle of 112 lb., the British method of quotation. Tin plate prices have been reduced by British makers to a point so low that some American mills claim to be no longer interested in export business at the prevailing price, which is about \$5.90 per base box, c.i.f. Japan, figuring back to about \$4.85 per base box, Pittsburgh. With most American makers of tin plate well booked from domestic sources of consumption and the domestic market at \$5.50, base Pittsburgh, such export prices are not considered at all favorable.

Inquiry for rails and reports of probable future purchases by Japanese railroads seem to constitute a large part of the current activity. However, in the bill now before the Japanese Diet, calling for a revision

in the tariff on tin plate, sheets and pig iron from the regular tariff which went into effect at the expiration of the conventional tariff, March 10, there seems to be prospect of better business in these products. Under the terms of this bill light gage black sheets would continue under the high rate of 17 per cent ad valorem; galvanized sheets, plain or corrugated at 18 yen per ton, specific duty; electrical sheets, containing less than 1 per cent silicon, 15 per cent ad valorem; more than 1 per cent, 5 yen per ton, conventional tariff; tin plate, 30 sen per 100 kin, the conventional tariff, and pig iron, 10 sen per 100 kin, the conventional tariff. Favorable action is expected on at least part of this bill, which maintains the desired protection of the light gage sheet industry developing in Japan, at the same time permitting large consumers of tin plate to obtain supplies from abroad at a reasonable duty.

In addition to other railroad business in the market from Japan, the Kyushu Electric Railway will open bids April 2 on 7500 tons of 80, 85 and 90 lb. rails. The Keihan Electric Railway has awarded one mile of 91-lb. grooved rails to Suzuki & Co., New York.

### End of Pig Iron Imports

An end of the period of importation of pig iron seems to be approaching, as European market prices rise and the American market softens. Importers with stocks in the United States are endeavoring to reduce iron on their yards before they are met with an unprofitable selling market here. At present it is possible to offer European iron at about \$23.75, c.i.f. Atlantic port, duty paid, which is not a particularly low price to consumers situated near domestic furnaces. In the New England district, however, sales continue, but on a restricted scale, compared with recent activity, purchases of 1000-ton lots having been displaced by orders for a few hundred tons. The Iron & Ore Corporation of America, with docks at Providence, R. I., has reduced its stock to between 4000 and 5000 tons available for immediate shipment to New England consumers. It is estimated that since Dec. 1 total pig iron imports, exclusive of Indian iron, have been between 75,000 and 80,000 tons.

## National Foreign Trade Council to Convene at Seattle

James A. Farrell, chairman of the National Foreign Trade Council, has issued a call for the twelfth assembly of that body, to be held in Seattle, Wash., June 24 to 26. Though mainly concerned with ways and means of increasing American foreign trade, the council will be international in scope for the first time. There is planned a series of group sessions at which American business men may confer with foreign delegates on phases of credit, sales methods, shipments and advertising.

"There is a new assurance of stability and progress in Europe, where steady improvement has been made for the last six years," said Mr. Farrell. "There is increasing activity in the countries across the Pacific, as well as in South America and other overseas markets."

"Foreign Trade Essential to Prosperity" will be the central theme of the Seattle convention. Delegations of business men will attend from China, Japan, India, Straits Settlements, the Dutch East Indies and the Philippines.

## Japan's Hope for Industrial Development

James W. Neill, mining engineer, Pasadena, Cal., has recently returned from an extensive trip to Japan where he made a study of iron ore conditions. Japan, he says, is looking forward to a new era in its industrial development through the prospects of making iron and steel in commercial quantities within its own boundaries. A number of foreign experts have been retained to investigate possible ore deposits within the Empire.

Mr. Neill has brought many samples to be analyzed by laboratories in the United States, some of the sam-

ples, he said, will be analyzed at the University of California.

The Matsukata family, one of the strongest of Japanese families, is taking a leading part in promoting investigation of areas of Japan where ore production is thought to be favorable. A large area, 500 miles from Tokyo, at the northern end of the main island, contains iron sand which is believed to be workable.

## Bookings of Commercial Steel Castings

WASHINGTON, March 17.—Bookings of commercial steel castings in February, based on reports from principal manufacturers, representing more than two-thirds of capacity of the United States, totaled 73,964 net tons, or 73.7 per cent of shop capacity, as against 82,922 tons, or 82.6 per cent of shop capacity, in January, according to the Bureau of the Census. Of the February bookings, 27,237 tons represented castings for railroads, and were 63.3 per cent of this kind of capacity, compared with 40,799 tons, or 94.9 per cent, in January. February bookings of miscellaneous castings totaled 46,727 tons, or 81.4 per cent of this class of capacity, compared with 42,123 tons, or 73.4 per cent of capacity, in January.

Domestic sales of oak leather belting reported by the Leather Belting Exchange for February, and representing about 60 per cent of the total production, are given as 360,984 lb., valued at \$609,703, or an average of \$1.69 per lb. These figures compared with 409,252 lb. in January, valued at \$686,316, or an average of \$1.68 per lb., and with 417,849 lb. in February of last year, valued at \$710,761, or an average of \$1.70 per lb.

# Iron and Steel Markets

## BUYING IN SHEETS

### Increased Activity in Automobile Industry

#### New Business in General Negligible — Production Still Heavy—Ore Rates

So far in March there has been no material let down in steel ingot production from the January-February rate. Shipments likewise are maintained at recent high levels and accumulations at mills, so far as it is possible to ascertain, are not large.

Estimates are that production has been as much as one-fourth to one-third greater than current consumption, so that no great volume of fresh buying is looked for in April. Specifications against contracts are freely obtainable and expectation is general that full quotas will be taken, giving mills good bookings well into April. This is not counting dormant contracts yet awaiting the starting of construction enterprises.

Much is made of the point that it is not that supplies are large, but that ease of getting deliveries is making it possible for consumers to operate at low inventories of material.

The automobile industry provided the feature in new demand. Low prices for automobile body sheets stimulated full second quarter covering simultaneously with a change to an increased production schedule for motor cars, resulting in an abandonment of the industry's 30-day buying policy and developing a fairly good purchasing movement in sheets and strip steel. The finding of bottom prices appears as a net result, with the effort now to stabilize at 3.50c., Pittsburgh, for black sheets, 4.60c. for galvanized and 2.70c. for blue annealed. On black sheets 3.40c. was done and on body sheets 4.40c. to 4.50c.

Many sheet mills will receive in the second quarter \$37 sheet bars covered on the last buying movement, and to this fact is in part due the deadlock in attempts to establish as high as \$39 on new sales.

In production, indications are, if anything, for some curtailment. For the first time in months Chicago mills show signs of gaining on commitments. In plates, fairly early deliveries are there possible. Order books in general are well filled and competition from Eastern mills is notably active.

Some independent steel makers in the Pittsburgh district are dropping out a few open-hearth furnaces and the Carnegie Steel Co. in the present week appears scheduled for an 86 per cent gait against 93 per cent last week.

Adoption by virtually all of the independent coke producers in the Connellsville region of the lower wage rate of 1917 resulted in little opposition from the workers and a reduction in the price of furnace coke.

The prospect of no higher rates on Lake Su-

perior ores and of lower coke has aroused buyers' hopes of lower second quarter pig iron. That tonnages purchased for first quarter are in many cases sufficient to cover needs well into the second also has had a weakening influence. On the other hand, competition from foreign irons is less serious and the end of the importing movement seems near. Some merchant furnaces which it was expected would soon be on the active list will not be blown in and some now active will be put on the idle list. With production decreasing, furnace operators will strongly resist further reductions in prices.

Prospective railroad buying is still encouraging. Some 650 cars were ordered and 3500 put out for estimates, including 1800 for the Missouri, Kansas & Texas.

Outstanding inquiries reported in structural steel include 27,000 tons for public utility projects in New York and Brooklyn. Bookings covered 23,000 tons.

Three more Lake boats, requiring 15,000 tons of steel, are under negotiation. A Kansas City pipe line bid on this week takes 5000 tons of plates.

Lately any premium on open hearth billets over the Bessemer product at \$37 has disappeared.

Announcement of fall terms on woven wire, not ordinarily made until May or June, is taken as an effort to keep wire mills active. Shipments in the last eight to ten weeks have been so heavy that general wire business is naturally quiet for the time being.

In bidding on a large tonnage of cast iron pipe for New York, domestic shops made low prices and succeeded in shutting out French competition.

No change has occurred this week in THE IRON AGE pig iron composite price which remains at \$22.13 per gross ton. Finished steel has dropped to 2.531c. per lb., from 2.546c. last week. Both figures are the lowest since December.

## Pittsburgh

### Automobile Companies Buying More Liberally — Wages of Coke Workers Reduced

PITTSBURGH, March 17.—Low prices on automobile body sheets appear to have very materially stimulated the demand for that product and to have caused the automobile builders to abandon the 30-day buying policy they have long observed, as the word here is that the orders taken at the new prices, which range from 4.40c. to 4.50c., base Pittsburgh, are for three months instead of for one month. The recessions from the recent quotations on those products, which moved upward twice after the big bookings of late last year, do not yet appear to have brought about very much improvement in new buying. Possibly the explanation in plates, shapes, bars and wire products, which beside sheets were the products on which two advances were



# A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Mar. 17, 1925	Mar. 10, 1925	Feb. 17, 1925	Mar. 18, 1924
No. 2X, Philadelphia...	\$24.26	\$24.26	\$25.01	\$24.13
No. 2, Valley Furnace...	21.00	21.00	22.00	23.00
No. 2, Southern, Cin'ti...	24.05	24.05	24.05	26.55
No. 2, Birmingham, Ala.†	20.00	20.00	20.00	22.50
No. 2 foundry, Chicago*	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa...	23.75	23.75	23.75	21.50
Basic, Valley furnace...	21.50	21.50	22.00	22.00
Valley Bessemer del. P'gh.	24.26	24.26	24.26	25.26
Malleable, Chicago*	24.00	24.00	24.00	24.00
Malleable, Valley	21.50	21.50	22.00	22.50
Gray forge, Pittsburgh...	22.26	22.26	23.26	23.76
L. S. charcoal, Chicago...	29.04	29.04	29.04	29.15
Ferromanganese, furnace...	115.00	115.00	115.00	107.50

Rails, Billets, Etc., Per Gross Ton:	Mar. 17, 1925	Mar. 10, 1925	Feb. 17, 1925	Mar. 18, 1924
O.-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh...	37.00	37.00	37.00	40.00
O.-h. billets, Pittsburgh...	37.00	38.00	38.00	40.00
O.-h. sheet bars, P'gh...	38.00	38.00	38.00	42.50
Forging billets, base, P'gh.	42.50	42.50	42.50	45.00
O.-h. billets, Philadelphia...	41.67	41.67	41.67	45.17
Wire rods, Pittsburgh...	48.00	48.00	48.00	51.00
Skelp, gr. steel, P'gh, lb...	2.10	2.10	2.10	2.30
Light rails at mill...	1.80	1.80	1.80	2.00

Finished Iron and Steel,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.28	2.28	2.28	2.57	
Iron bars, Chicago...	2.10	2.10	2.00	2.40	
Steel bars, Pittsburgh...	2.10	2.10	2.10	2.40	
Steel bars, Chicago...	2.20	2.20	2.20	2.50	
Steel bars, New York...	2.44	2.44	2.44	2.74	
Tank plates, Pittsburgh...	2.00	2.00	2.00	2.40	
Tank plates, Chicago...	2.30	2.30	2.30	2.60	
Tank plates, New York...	2.34	2.34	2.34	2.64	
Beams, Pittsburgh...	2.10	2.10	2.10	2.40	
Beams, Chicago...	2.30	2.30	2.30	2.60	
Beams, New York...	2.44	2.44	2.44	2.69	
Steel hoops, Pittsburgh...	2.40	2.40	2.50	2.90	

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.  
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	Mar. 17, 1925	Mar. 10, 1925	Feb. 17, 1925	Mar. 18, 1924
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.40	3.50	3.50	3.75
Sheets, black, No. 28, Chi-				
cago dist. mill...	3.70	3.70	3.70	4.90
Sheets, galv., No. 28, P'gh.	4.60	4.65	4.75	4.90
Sheets, galv., No. 28, Chi-				
cago dist. mill...	4.85	4.85	4.85	...
Sheets, blue, 9 & 10, P'gh.	2.70	2.70	2.70	2.90
Sheets, blue, 9 & 10, Chi-				
cago dist. mill...	2.80	2.80	2.80	...
Wire nails, Pittsburgh...	2.85	2.85	2.85	3.00
Wire nails, Chicago dist.				
mill...	2.95	2.95	2.95	...
Plain wire, Pittsburgh...	2.60	2.60	2.60	2.75
Plain wire, Chicago dist.				
mill...	2.70	2.70	2.70	...
Barbed wire, galv., P'gh.	3.55	3.55	3.55	3.80
Barbed wire, galv., Chi-				
cago dist. mill...	3.65	3.65	3.65	...
Tin plate, 100 lb. box, P'gh.	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	Mar. 17, 1925	Mar. 10, 1925	Feb. 17, 1925	Mar. 18, 1924
Carwheels, Chicago	\$17.00	\$17.50	\$19.50	\$20.50
Carwheels, Philadelphia...	18.50	18.50	19.50	18.50
Heavy steel scrap, P'gh...	19.00	18.50	19.00	19.50
Heavy steel scrap, Phila...	16.00	16.00	17.50	16.50
Heavy steel scrap, Ch'go...	16.50	17.00	18.00	16.25
No. 1 cast, Pittsburgh...	19.00	19.00	20.50	20.00
No. 1 cast, Philadelphia...	18.00	18.00	19.00	18.50
No. 1 cast, Ch'go (net ton)	18.00	18.50	19.00	20.00
No. 1 RR. wrot. Phila...	19.00	19.00	20.00	19.00
No. 1 RR. wrot. Ch'go (net)	14.50	15.00	16.50	13.75

Coke, Connellsville, Per Net Ton at Oven:	Mar. 17, 1925	Mar. 10, 1925	Feb. 17, 1925	Mar. 18, 1924
Furnace coke, prompt...	\$3.25	\$3.50	\$3.50	\$4.00
Foundry coke, prompt...	4.25	4.25	4.25	4.75

Metals,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.62 1/2	14.62 1/2	15.00	14.12 1/2	
Electrolytic copper, refinery	14.25	14.25	14.50	13.75	
Zinc, St. Louis...	7.35 1/2	7.35	7.55	6.45	
Zinc, New York...	7.67 1/2	7.70	7.90	6.80	
Lead, St. Louis...	8.72 1/2	8.75	9.12 1/2	9.15	
Lead, New York...	9.00	9.00	9.40	9.15	
Tin (Straits), New York...	53.00	53.37 1/2	57.12 1/2	58.75	
Antimony (Asiatic), N. Y.	15.75	16.00	21.50	11.00	

## THE IRON AGE Composite Prices

March 17, 1925, Finished Steel, 2.531c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 85 per cent of the United States output of finished steel.	{	March 10, 1925...	2.546c.
		Feb. 17, 1925...	2.546c.
		March 18, 1924...	2.746c.
		10-year pre-war average...	1.889c.

March 17, 1925, Pig Iron, \$22.13 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.	{	March 10, 1925...	\$22.13
		Feb. 17, 1925...	22.50
		March 18, 1924...	22.77
		10-year pre-war average...	15.72

High	Low	High	Low	High	Low	High	Low
1923	1924	1925	1925	1924	1923	1923	1923
2.824c., April 24	2.789c., Jan. 15	2.560c., Jan. 6	2.531c., March 17	2.460c., Oct. 14	2.446c., Jan. 9	2.824c., April 24	2.789c., Jan. 15
\$30.86, March 20	\$22.88, Feb. 26	\$22.50, Jan. 13	\$22.13, March 10	\$19.21, Nov. 3	\$20.77, Nov. 20	\$30.86, March 20	\$22.88, Feb. 26

announced since last December, is to be found in the fact that sellers were extremely liberal in their bookings at the low prices and shipments to buyers have been so heavy that they have not yet found it possible to work enough into actual consumption to need additions to their commitments. Another factor is that the price structure is not extremely strong. There are a number of buyers who believe that if they waved an attractive inquiry for bars and shapes before manufacturers they would not be obliged to pay 2.10c., base Pittsburgh. Getting rid of their low-priced mill orders has been one of the difficulties that has beset the manufacturers in their efforts to put prices on a higher level. Suggestions still are heard that nails are available at \$2.75, base Pittsburgh, on new business and that \$2 a ton above that level is easily done despite the

fact that makers' books were supposed to have been closed Feb. 15 on business at \$2.85, Pittsburgh. Fall dating on woven wire fence now applies to the entire country.

The first half of March saw no material letdown in the ingot production of this and nearby districts from the January and February rate, but if there has been a definite tendency this week, it is toward a lower rate. Some of the Pittsburgh district independents have dropped a few open-hearth furnaces and the Carnegie Steel Co., which last week produced at 93 per cent of capacity, is starting off this week at 86 per cent gait and expects to hold at that rate throughout the week. Blast furnace activities are the same as a week ago, but it is reported from Buffalo that another merchant furnace in that district has been blown out.

Most of the independent Connellsville district coal and coke producers posted notice of a reduction in wages March 16, going back to the November, 1917, scale which was in effect over the latter half of last year. A little trouble developed in a few instances, but generally the men preferred work to idleness and the new scale has found fairly general acceptance. This, of course, means a reduction in the fuel cost to pig iron producers, and dullness in the pig iron market is partly due to the fact that melters are waiting on the blast furnace men to show the lower fuel costs in their pig iron prices. The dullness in pig iron, which is of a most pronounced sort, however, is chiefly due to the fact that melters overbought late last year and either have the iron on their yards or are covered by contracts to an extent that makes them independent of additional purchases until well into the second quarter.

The feature of the scrap market is the fact that a Pittsburgh district steel maker, after an unsuccessful effort to buy heavy melting steel at \$18.50, paid \$19 for a round tonnage.

**Pig Iron.**—It is difficult to picture a quieter market than the local one has been in the past week insofar as local business has been concerned. It is now apparent that consumers considerably overestimated their first quarter requirements in their purchases of late last year and what they bought at that time promises to be sufficient to carry many of them well into the second quarter of the year. Naturally, their interest in supplies for the three months beginning April 1 is restricted by that fact and there is also the consideration that the wage reduction in the Connellsville district means lower producing costs and this leads to expectation of lower pig iron prices. The reduction in coke wage scales restores conditions that ruled over the last half of last year and with coke prices virtually back to where they were late last year, the tendency of buyers is to wait for pig iron to work lower. Hardly enough business has been done upon which to base a change in prices, but there is little doubt that buyers will be obliged to pay \$21 for No. 2 foundry, \$21.50 for basic and \$22.50 for Bessemer, which are now the asking prices of merchant producers. It was supposed that when the large lot of foundry iron recently sold at \$21 for the base grade a slight advance would be possible for small lots, but on small lot inquiries that have been out, \$21 has been the quotation in all cases. Competition for foundry iron business is a good deal sharper in this district than it was even as recently as a year ago. Two merchant furnaces formerly engaged solely in the steel making grades have gone over to the making of foundry iron and a third furnace of the same sort is now a fairly regular producer of foundry iron. Steel companies also have gone in more strongly for foundry iron to keep busy surplus capacity. Bessemer iron has been offered as low as \$21.50 and so far as sales are concerned \$21.50 is not seriously regarded as a possibility on the next sale of basic iron of any consequence. The Standard Sanitary Mfg. Co. has completed its second quarter purchases for its Louisville, Ky., plant. It purchased 8000 tons of Southern iron at \$20.50, Birmingham, for No. 2, and 6000 tons of southern Ohio iron at about \$21, Ironton, for the base grade. This represents a considerable increase in the amount of southern Ohio iron over the amount usually purchased by this company for Louisville.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic .....	\$21.50
Bessemer .....	22.50
Gray forge .....	20.50
No. 2 foundry .....	21.00
No. 3 foundry .....	20.50
Malleable .....	21.50
Low phosphorus, copper free .....	29.00

**Ferroalloys.**—Not enough new business is being done to establish any change in prices. Steel manufacturers in this and nearby districts some time ago arranged for supplies to meet their requirements over at least the first half of this year, and there is no evidence in the shape of fresh demands to suggest that there was any miscalculation of estimated needs. Specifications against contracts are good, but new business amounts to little. Quotations are given on page 869.

**Semi-Finished Steel.**—Interest centers around second quarter sheet bar tonnages, but actual business of this sort is held up by a difference of price ideas between makers and buyers. The latter believe that in view of the prices now obtainable for sheets, they should get their sheet bars at not over \$36, f.o.b. Pittsburgh or Youngstown. There may be a few producers who still are asking \$39, f.o.b. those points, but it is generally admitted that this price cannot be obtained either for early shipment or second quarter tonnages, and lately a number of efforts to uncover purchasers willing to pay \$38 have been fruitless. A recent sale of second quarter tonnage at \$39, delivered at the buyer's mill, now appears to have been a good one viewed from the seller's standpoint. The market on billets and slabs is purely nominal, since in these forms buyers expect lower prices and there is almost no business. On Bessemer billets the market right along has been quotable at \$37, and lately any premium that open-hearth steel had over that price has disappeared. Buyers are not pressing for delivery, and there are some makers who would take open-hearth billet business at \$37. Forging billets are not easy to sell at about \$42.50 and \$48, base, Pittsburgh and Cleveland, appears to be the top on wire rods. No sales of skelp of importance are noted at the present price, as large users were covering by contracts at well below that price. Steel ingot production for the first half of this month appears to have maintained the rate of January and February in this and nearby districts. Prices are given on page 869.

**Wire Products.**—New business is quieter in all products than it has been, but independent manufacturers regard that as purely a natural development in view of the fact that their shipments for the past 8 or 10 weeks have been extremely heavy. Based on capacity figures, the shipments in that period have been above 100 per cent, and the mills in this district now report their warehouse stocks to be badly broken. Consumers and jobbers are well stocked, and there must be heavier consumption than there has been so far this year to necessitate further heavy purchases. Fall dating on woven wire fence has been granted to all parts of the country; one interpretation of this move, which was made under date of March 12 by the leading producer, is that the spring demand has not been up to expectations and that makers are anxious to keep orders flowing in. Prices on other wire products are irregular, notably on nails. Some makers expect to have all of their low-priced nail business completed by the end of the month, but there are other reports that it is still possible to place business at \$2.75, Pittsburgh, and that \$2.85 is easily done, although books were supposed to have been closed for business at that price Feb. 15. Prices are given on page 868.

**Rails and Track Supplies.**—Spikes and tie plates are moving well from local plants on old orders, but new business is rather slow, and there is some shading of prices by those who have worked out of their orders. No improvement can be chronicled of the light rail business. Standard rail orders are large and specifications are heavy. Prices are given on page 868.

**Tubular Goods.**—Jobbers appear to be well stocked with standard merchant pipe, and as the movement into consumption has not been sufficient to make great inroads on their holdings, new orders are smaller than they were recently. There is a compensating gain, however, in oil country pipe, and there is enough line pipe business on the mill books to provide a heavier operation of lapweld furnace capacity than was possible a short time ago. Weakness continues in the local secondary market, but mill prices are well maintained. Boiler tube business is satisfactory from the standpoint of sales, but hardly so on the score of prices, which still lean in buyers' favor. Discounts are given on page 868.

**Sheets.**—Makers in this district derive some satisfaction from the fact that low prices have at least resulted in an abandonment by the automotive industry of its recent 30-day buying policy and brought out for the first time in several months orders from that source covering three months' requirements. The



automobile builders generally are feeling the effect of more favorable weather conditions in increased sales, and this has resulted in increased production schedules. The Buick division of the General Motors Corporation, starting March 16, raised its daily output from 700 to 850 cars. Automobile body sheets have receded further in prices, however, and that grade now is quotable at 4.40c. to 4.50c., base (No. 22 gage), or \$2 a ton below last week's levels. Low prices do not seem to be bringing about any decided betterment in business in the common finishes. The effort now is to establish the market at 3.50c., base, Pittsburgh for black, 4.60c., base, for galvanized, and 2.70c., base, for blue annealed. At the moment, however, 3.40c. is easily done on black sheets and is the more common sales price; there is some shading even of 4.60c. on galvanized, but 2.70c. appears to be fairly rigid on blue annealed. Prices are given on page 868.

**Tin Plate.**—All signs continue to point to a big year in tin plate for packers' cans. Can companies are urging shipments against contracts, a condition that is without parallel in other steel products just now, and the spring is opening so nicely in most crop producing districts that manufacturers are expecting a good many supplementary orders in the next 30 days. The American Sheet & Tin Plate Co. is so heavily committed at its Gary and Elwood, Ind., plants that it can take no more first half business for those plants, and much business that would go to either of those plants now is being diverted to Pittsburgh district mills. In some cases the company has to absorb freight to equalize with the Indiana mills. The price is steady on standard cokes at \$5.50 per base box, Pittsburgh, for domestic account.

**Structural Material.**—New business in plain structural steel still suffers from the fact that consumers were very heavily protected at much lower prices and the fact that the price has failed to hold at 2.20c. base which was announced early last month encourages buyers to hold off in the belief that they can do better than 2.10c. Structural shops in this district are fairly busy on old jobs and the report is that new inquiry is better as the spring approaches. Plain material prices are given on page 868.

**Plates.**—Plate mill capacity in this district is still reasonably well engaged, but it is chiefly on old business and with backlogs being steadily eaten into, selling pressure is increasing. Most mills have a quotation of 2.10c., base Pittsburgh, but 2c. still is the realization hope on large tonnages. Prices are given on page 868.

**Steel and Iron Bars.**—No trouble now is being experienced by buyers even of small tonnages of steel bars in obtaining them at 2.10c. base, Pittsburgh. Mills in this and nearby districts still have fair sized order books, but it is noted that while contract buyers are accepting full quotas, they are not urging deliveries, and this enables producers to take on new business and make very prompt delivery. The amount of business taken at 2.20c. base, Pittsburgh, was negligible and there is doubt that the entire bookings of mills in Pittsburgh and Youngstown at that price aggregated as much as 5000 tons. Iron bars are steady at recent prices. Prices are given on page 868.

**Cold-Finished Steel Bars and Shafting.**—The fact that a number of automobile manufacturers are increasing their production schedules encourages expectations of an early increase in the consumption of screw stock bars and a consequent demand upon makers for fresh supplies. Demands from that industry so far this year have been well below those of the same period last year and also below the expectations of the latter part of last year. The trade, however, figures that the first half of the year will average up well because at this time last year the automobile parts makers were suspending and canceling much second quarter business, while this year the requirements of that period are largely ahead. Makers in this district will have a market price of 2.80c. base, Pittsburgh, but only a little tonnage has been taken at that price and its maintenance is impaired by the fact that contract buyers were covered for the present quarter at

2.70c. base and still have much tonnage due them at that price. Some mills are quoting 2.70c. on new business. There is some talk that makers of hot-rolled bars are going to exact the extra for screw stock quality bars on second quarter tonnages. As originally adopted but never generally enforced, this extra was \$3 a ton. The extra to be charged by independent makers is \$2 per ton.

**Hot-Rolled Flats.**—Products under this heading are still rather slow. Some of the larger users of strips are still to speak for second quarter tonnages. Prices are fairly steady at recent levels. They are given on page 868.

**Cold-Rolled Strips.**—This product seems to have pretty definitely receded to 4c. base, Pittsburgh. There is still a quotation of 4.15c., but on almost all business lately entered the price has been 4c.

**Bolts, Nuts and Rivets.**—Makers of bolts and nuts in this district still find business quiet. Buyers have much tonnage due them on first quarter contracts but are waiting until close to the expiration date before sending along specifications. On lots of a carload or more an additional 5 per cent beyond the quotations is being given. Sizable orders for large rivets usually go at less than the quoted price. Prices and discounts are given on page 869.

**Coke and Coal.**—Posting of reduced wages in the Connellsville district by almost all of the independent producers has found quick reflection in the coke price, particularly of the furnace grade. Spot tonnages of furnace coke have sold at \$3.25 per net ton at oven, one such sale amounting to 3500 tons for shipment over the next 30 days. Some producers still are asking \$3.50, but at present that price is not readily obtained for much tonnage. The change in the wage scale has resulted in some unsettlement of operating schedules and it is believed this will shorten the supply of spot coke, but the fact that the men generally accepted the cut without question probably means that any decrease in production will be temporary. The spot furnace coke market was around \$3 to \$3.25 before wages were advanced last December, and with the return to the lower wage scale the market is expected to settle to about that range. Foundry coke is somewhat easier, but not notably lower. Coal still is depressed.

**Old Materials.**—A down river steel maker, after considerable effort to buy heavy melting steel at \$18.50 closed late last week on a substantial tonnage at \$19. A Warren, Ohio, consumer, with rather exacting specifications, also bought a round tonnage of this grade in the past week and paid \$20. The Youngstown district usually is higher on steel works scrap than the Pittsburgh market, and this sale proves the case. The market in Pittsburgh remains quotable at \$18.50 to \$19 on heavy steel scrap, but only small lots are available at the lower figure, and \$19 is more representative of the price of consumers of sizable lots. Low phosphorus scrap is weak and lower, because the steel foundries are such sparing buyers, but the market has moved upward again on turnings.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$19.00
No. 1 cast, cupola size.....	\$19.00 to 19.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa. ....	20.50 to 21.00
Compressed sheet steel .....	18.00 to 18.50
Bundled sheets, sides and ends..	16.50 to 17.00
Railroad knuckles and couplers..	21.50 to 22.00
Railroad coil and leaf springs...	21.00 to 21.50
Low phosphorus blooms and billet ends .....	23.00 to 23.50
Low phosphorus plate and other material .....	21.50 to 22.00
Railroad malleable .....	18.00 to 18.50
Steel car axles.....	21.50 to 22.00
Cast iron wheels.....	19.50 to 20.00
Rolled steel wheels.....	21.50 to 22.00
Machine shop turnings .....	15.00 to 15.50
Short shoveling turnings .....	15.00 to 15.50
Sheet bar crops.....	20.00 to 20.50
Heavy steel axle turnings.....	18.00 to 18.50
Short mixed borings and turnings	15.00 to 15.50
Heavy breakable cast .....	14.00 to 14.50
Stove plate .....	15.00 to 15.50
Cast iron borings .....	14.50 to 15.00
No. 1 railroad wrought.....	15.00 to 15.50
No. 2 railroad wrought.....	13.50 to 14.00

## Chicago

### Foreign Competition on Reinforcing Steel Bars—Railroad Buying Encouraging

CHICAGO, March 17.—The Middle West's feeling of security against foreign competition in finished iron and steel products has been given a jolt by a quotation on reinforcing steel filed with the United States Engineer's Office at Milwaukee. Figures were taken on 250 tons, and the low bidder was E. S. McCormick, New York, with a price of 1.97c., delivered Milwaukee, on steel which is presumed to be of German or Belgian manufacture. The second lowest figures were two bids of 2.08c., Milwaukee, or 2c., Chicago, on rail steel bars, while billet steel bars were quoted at 2.78c., Milwaukee, or 2.70c., Chicago warehouse. The McCormick bid was thrown out because of lack of information regarding the origin of the steel offered. This is the second instance of foreign competition in this territory in two weeks. At Detroit a week ago a French quotation on 1100 tons of 12- and 16-in. cast iron pipe was 20c. a ton under the lowest domestic bids. Here again foreign competition was unsuccessful, as all bids were rejected and new figures will be asked.

The threat of European competition in the Western steel market is not taken seriously, notwithstanding the unexpected development at Milwaukee. Competition from domestic mills located east of Chicago is, however, a factor of growing importance. On sheets outside mills are not only absorbing the freight to Chicago, but are freely quoting \$2 a ton below the figures to which local producers raised their prices on the last advance. A similar situation is developing in nails and wire, and on plates a Pennsylvania producer has met the Chicago price of 2.30c., which is equivalent to 1.96c. at Pittsburgh. The forward bookings of mills in the Chicago district are undoubtedly much heavier than those of producers in other centers. In fact, a local maker of bars, shapes, plates and rails is still booking new business slightly in excess of shipments. The margin between specifications and deliveries continues to be a comfortable one, pointing to another increase in unfilled tonnage for that company in March. Local capacity in these products is still fully engaged and all but one of the 34 steel works blast furnaces in this district remain active. Ordinarily the favorable condition of local mills would point to continued stability of prices, but the expanding pressure for business on the part of Eastern mills introduces a factor of uncertainty which Chicago producers must cope with. In this connection it should be noted that the ruling open market quotation on plates at Pittsburgh is now 2c., or the equivalent of 2.34c., delivered Chicago, only 4c. per 100 lb. more than the price of Chicago mills.

Prospective railroad buying is the most encouraging feature of the market. Following the Southern Pacific's request for figures on 3400 cars put out a week ago, other inquiries have appeared, the largest being one from the Missouri, Kansas & Texas for 1800 cars.

**Pig Iron.**—The first important second quarter purchase in many weeks was made today by a Western buyer located at a point with equal freight rates from Chicago and St. Louis. The order calls for 1000 tons of basic and the price has not yet been disclosed, although it is said to figure back to less than the quotation of \$24, furnace, heretofore carried by local sellers. Outside of this transaction, there has been little buying except for small lots for spot delivery. A Michigan melter has entered the market for 800 tons of foundry for second quarter and an inquiry of long standing from another Michigan user, calling for 2000 tons of malleable is still alive. An automobile builder has closed for several hundred tons of silvery and a sale of 100 tons of silvery has been made to a local plant.

Silvery remains weak, with concession of \$1 a ton not uncommon. A local buyer has closed for 400 tons of 14 to 16 per cent for delivery at a St. Louis district plant. Two carlot sales of this material to local users brought \$47.42, delivered. Sales of Southern foundry in this territory are negligible.

Quotations on Northern foundry, high phosphorus, malleable and basic irons are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$24.00
Northern No. 1 foundry, sil. 2.25 to 2.75	25.00
Malleable, not over 2.25 sil.	24.00
Basic	24.00
High phosphorus	24.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (barge and rail)	25.68
Southern No. 2, sil. 1.75 to 2.25	\$26.51 to 27.01
Low phos., sil. 1 to 2 per cent, copper free	33.29 to 33.79
Silvery, sil. 8 per cent	35.29
Electric ferrosilicon, 14 to 16 per cent	45.00 to 47.42

**Ferroalloys.**—Carlot sales of spiegeleisen have been made at \$32, Eastern furnace, a decline of \$1 a ton. Little interest is manifested in ferromanganese, which remains unchanged as to price. German ferromanganese, which is offered at \$110, seaboard, is not of standard analysis, being excessively high in phosphorus.

We quote 80 per cent ferromanganese, \$122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, \$85, delivered; spiegeleisen, 18 to 22 per cent, \$41.58, delivered.

**Plates.**—A considerable tonnage of steel for car builders is still unspecified and in view of the recent appearance of new inquiries for rolling stock, the largest of which comes from the Southern Pacific, mills are counting on a fair volume of new business. Nevertheless, local mills have gained on their commitments and are now able to make fairly early deliveries. Local prices are firmly held, but mills east of here have largely eaten up their backlogs and are reaching further and further west in their quest for tonnage. One producer, in fact, recently met the Chicago price of plates in quoting on a local tonnage, absorbing the freight disadvantage from Pittsburgh. Owing to the absence of demand for oil storage tanks, tank fabricators are not factors in the plate market.

The mill quotation is 2.30c., Chicago. Jobbers quote 3.10c. for plates out of stock.

**Bars.**—In soft steel bars the competition of outside producing centers is an increasing factor in the territory east of Chicago, although it has not yet been felt to any appreciable extent locally. Chicago mills are heavily booked ahead and continue to add to their commitments. Business continues to come from concrete bar distributors, bolt, nut and screw manufacturers, farm implement makers and the automobile industry. The farm equipment manufacturers report increasing business in tractors, which are in greater demand than other types of agricultural tools. The wants of automobile makers are expanding as the season advances. New bookings in bar iron are declining and one important producer has gone from double turn to single turn operations. The market remains firm at 2.10c., Chicago, however. Rail steel bars are steady at 2.10c., mill, and producers still have comfortable backlogs.

Mill prices are: Mild steel bars, 2.20c.; common bar iron, 2.10c., Chicago; rail steel, 2.10c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.70c.

**Wire Products.**—Fall terms have been announced on woven wire fencing, although announcement is ordinarily not made until May or June. Specifications for wire and nails are lighter than had been expected and new business is slow in developing. This is especially true of wire nails. Jobbers report that they cannot place further specifications for this product because their present stocks are not moving. Lack of rain in the Southwest is said to have interfered with business in that section. Competition among mills is keen and less difficulty is experienced in placing orders at the price which prevailed before the last advance. In



the Southwest and South Pittsburgh mills have become more important factors through the use of river transportation. The Pittsburgh Steel Co. has established a stock in the Missouri, Kansas & Texas warehouse building at St. Louis, and has acquired space for similar purposes at Memphis. For mill prices see page 869.

**Rails and Track Supplies.**—The Midland Valley Railroad has placed 2650 tons of rails with a local mill. Business in track supplies is in good volume, recent orders including 1000 tons of angle bars, 2600 tons of tie plates and 5300 kegs of spikes. The railroads continue to specify liberally against their rail and fastening contracts. Lower prices quoted on tie plates at outside producing centers are a factor in competition for business in the territory east of Chicago.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.90c. to 2c., f.o.b. makers' mill.

Standard railroad spikes, 3c. mill; track bolts with square nuts, 4c. mill; steel tie plates, 2.45c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c. base, and track bolts, 4.45c. base.

**Sheets.**—Pressure for business on the part of the mills is increasing and this is particularly true of producers in outside centers. Concessions of \$2 a ton below the last advance in prices are now rather common, and in some instances even lower prices have been quoted. Sellers are still hopeful that a buying movement will materialize with the arrival of spring weather, and a slight increase in both orders and inquiries for early shipment is regarded as encouraging. Local capacity is committed through April, although holes in the rolling schedules permit the taking of some tonnage for nearby delivery.

Chicago delivered prices from mill are 3.75c. to 3.85c. for No. 28 black, 2.85c. to 2.95c. for No. 10 blue annealed, 4.90c. to 5c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.80c. base for blue annealed, 4.50c. base for black, and 5.50c. base for galvanized.

**Cast Iron Pipe.**—Detroit finally rejected all bids on the 11,900 tons which came up for figures March 6, and will readvertise. Mahoning County, Ohio, also rejected bids on 1400 tons and will take new bids March 26. The United States Cast Iron Pipe & Foundry Co. has booked 1000 tons for Cleveland and 400 tons for Philips, Wis. The National Cast Iron Pipe Co. will supply 325 tons for Canton, Ohio, and 125 tons for Rushville, Ind. James B. Clow & Sons have orders for 125 tons for New London, Wis., and 115 tons for Two Rivers, Wis. That company is also low on 265 tons for Highland Park, Mich. Pending business includes:

Chicago, 570 tons of 8-in., bids to be in March 27.  
Oakpark, Ill., 222 tons of 12-in., 85 tons of 8-in. and 144 ft. of 6-in., March 17.  
Muskegon, Mich., 100 tons of 6-in., March 20.  
Robinsville, Minn., 500 tons, March 18.

We quote per net ton, f.o.b. Chicago, as follows:  
Water pipe, 4-in., \$51.20 to \$52.20; 6-in. and over, \$47.20 to \$48.20; Class A and gas pipe, \$4 extra.

**Bolts, Nuts and Rivets.**—Contracting for second quarter is proceeding slowly and specifications, although in good volume, are not coming in with a rush. Buyers of bolts and nuts are not yet satisfied that present discounts will hold; in fact, as low as 60 and 10 off on large machine bolts has been reported. Small rivets range from 70 to 70 and 10 off, Chicago, and large rivets are weak at \$2.75, Chicago.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to  $\frac{3}{4}$  x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to  $\frac{3}{4}$  x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, squares, tapped or blank, \$3.50 off; hot pressed nuts, hexagons, tapped or blank, \$4 off; coach or lag screws, 60 per cent off.

**Reinforcing Bars.**—The week has been a quiet one from the standpoint of fresh lettings, but a very large tonnage in pending work is rapidly approaching the closing stage. Lettings include:

Denfeld High School, Duluth, Minn., 760 tons to Cowin & Co.

Union League Club building, Chicago, 150 tons to American System of Reinforcing.

Public School building, Linder and Balmoral Avenues, Chicago, 150 tons to Concrete Engineering Co.

Pending work includes:

Illinois Central Railroad, undercrossing at Sixty-seventh Street, Chicago, 400 tons.

Illinois State road work, 1000 tons, bids on general contracts to be taken March 16.

Medinah Country Club, Medinah, Ill., 100 tons.

**Structural Material.**—Fabricating awards for the week were light, the only large letting being 3500 tons for an office building at Houston, Tex. Fresh inquiries are few, although much work is still on architects' boards. Figures are in on the Stevens Hotel, Chicago, 17,000 tons, but no award has yet been made. Mill bookings in plain material are still large and local prices are unchanged.

The mill quotation on plain material is 3.30c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

**Coke.**—Most users of by-product foundry coke have covered their requirements through the first half at \$10.75, delivered in Chicago switching district, or f.o.b. ovens for outside shipments. Shipments of local ovens are equal to production.

**Old Material.**—The market has developed further weakness and most grades have declined 50c. a ton. A large consumer of low phosphorus steel bought a round tonnage, but at concessions. The last mill purchase of heavy melting steel, a small one, was at \$17, delivered. The only railroad offering is 550 tons advertised by the Grand Trunk.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	\$18.50 to \$19.00
Cast iron car wheels	17.00 to 17.50
Relaying rails, 56 and 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	19.00 to 19.50
Railroad tires, charging box size	19.00 to 20.00
Railroad leaf springs, cut apart	19.00 to 19.50
Rails for rolling	18.00 to 18.50
Steel rails, less than 3 ft.	19.00 to 19.50
Heavy melting steel	16.50 to 17.00
Frogs, switches and guards cut apart	17.00 to 17.50
Shoveling steel	16.25 to 16.75
Drop forge flashings	12.00 to 12.50
Hydraulic compressed sheets	13.50 to 14.00
Axle turnings	14.25 to 14.75
Steel angle bars	18.00 to 18.50
Steel knuckles and couplers	18.50 to 19.00
Coil springs	20.00 to 20.50
Low phos. punchings	18.00 to 18.50
Machine shop turnings	10.50 to 11.00
Cast borings	14.00 to 14.50
Short shoveling turnings	14.00 to 14.50
Railroad malleable	19.00 to 19.50
Agricultural malleable	17.50 to 18.00
Per Net Ton	
Iron angle and splice bars	18.50 to 19.00
Iron arch bars and transoms	19.50 to 20.00
Iron car axles	24.00 to 24.50
Steel car axles	16.50 to 17.00
No. 1 busheling	13.00 to 13.50
No. 2 busheling	10.00 to 10.50
Pipes and flues	10.50 to 11.00
No. 1 railroad wrought	14.50 to 15.00
No. 2 railroad wrought	14.75 to 15.25
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	16.50 to 17.00
No. 1 agricultural cast	16.50 to 17.00
Locomotive tires, smooth	17.00 to 17.50
Stove plate	14.00 to 14.50
Grate bars	13.50 to 14.00
Brake shoes	13.50 to 14.00

Construction has begun on a new two-story, steel and concrete warehouse being built at Elk and Katharine Streets, Buffalo, for Beals, McCarthy & Rogers, dealers in iron and steel supplies, tools and hardware. It is planned to have the warehouse finished in the spring.

Negotiations are under way by which the Peter Pirsch & Sons Co. of Kenosha, Wis., expects to buy the old property of the Preston Motor Co., Birmingham, Ala., and will install machinery for the manufacture of motor fire apparatus. The steel will be purchased from the Tennessee company and other material obtained in the Birmingham district.

## New York

### Importing of Iron Nearly Ended, But Still Has Depressing Effect

NEW YORK, March 17.—The importing of foreign iron for sale in the East is rapidly drawing to a close. The experiment of manufacturing pig iron in Holland has not proved profitable and neither the Dutch, Indian nor other irons can now be sold at a profit in competition with the domestic product. At Providence, from 4000 to 5000 tons of foreign iron is now piled and this and other unsold foreign tonnages are having a depressing effect upon the market, which is extremely dull. Sales of the past week have been small, and pending business is limited. Inquiries, some of which are not new, are: 2000 tons for second quarter for the New York Air Brake Co.; 750 tons for the Bayonne plant of the General Electric Co., second quarter; 1000 tons for the Ingersoll-Rand Co. for delivery in 30 to 45 days, and 1000 tons for delivery to a New England melter in 30 to 60 days. While the prevailing quotations are still \$23, furnace, for No. 2 plain in eastern Pennsylvania and \$22, Buffalo, it is believed that the latter quotation could be shaded by 50c. without much difficulty.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25...	\$25.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25 .....	26.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75 .....	26.52
Buffalo, sil. 1.75 to 2.25 .....	\$26.41 to 26.91
No. 2 Virginia, sil. 1.75 to 2.25...	29.44

**Ferroalloys.**—New business in ferromanganese continues very light, with transactions embracing only carload and small lots and very few of these. Sales of spiegeleisen have amounted to 300 or 400 tons, made up also of carload and small lot orders. There are inquiries before the market calling for about 300 tons. There has been no change in quotations for either alloy.

**Warehouse Business.**—Prices have been shaded on a fair movement in structural steel, reflecting limited demand and good-sized jobbers' stocks. New York building permits have declined measurably. A spurt in reinforcing bars brought an advance to 3.05c. In other lines activity is slightly better, spring demand, though tardy, coming to help sheets a little. New extras have appeared on hoops and bands, conforming with the mill schedule. In most cases the card shows an advance over the previous list, as from \$1 to \$1.40 on ¾-in. bands, and \$1.35 to \$2.90 on ½-in. hoops. Several large orders were taken for welded pipe, in which prices appear strong. In a few lines there is a softening in prices. We quote boiler tubes per 100 ft. for shipment from New York as follows:

Lap welded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

**Finished Iron and Steel.**—With the beginning of the second quarter of the year only two weeks off developments tending to indicate the trend of demand are singularly lacking. Of course there has been contracting in a few lines, principally bars, but for the most part manufacturing consumers and jobbers are content with taking out their quotas on first quarter tonnage and seem undisturbed about prospects for second quarter. As previously intimated in these reports, the tonnage now being specified or which will be specified before the end of this month will carry many consumers well along into second quarter. Bars seem to be fairly firm at 2.10c., Pittsburgh basis, but there is not the same degree of strength in other hot rolled products. Two sellers of reinforcing bars now ask 2.20c., base. Plates are being sold at 2c., one lot of 300 tons having gone at that price a few days ago. Some of the larger structural jobs are being figured at not over 2c., Pittsburgh, for the shapes, this being a form of "protection" which apparently was quite commonly granted to many of the fabricators. Construction work requiring structural shapes and concrete reinforcing bars is not up to

expectations for this time of year. It is stated that 6000 tons of concrete bars required for a municipal sewer in Brooklyn will be purchased from an American mill instead of foreign steel being used, as was thought likely. While there was a possible saving of \$12 a ton on the foreign bars, it would have been necessary for the contractor to take the entire quantity at one time, a somewhat impossible undertaking in work that will require fully a year to complete. A New York State mill will roll about 600 tons of bars for a warehouse to be built for Sears, Roebuck & Co. in Philadelphia. Railroad car inquiries and awards show some signs of increasing and prospects for more active buying of equipment by the railroads are believed by the car builders to be fairly good.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.44c. to 2.54c.; plates, 2.34c. to 2.44c.; structural shapes, 2.44c. to 2.54c.

**Cast Iron Pipe.**—Opening of bids on ball and spigot pipe by the Department of Water Supply, Gas and Electricity, New York, March 16, resulted in low bids on 1500 tons by the Warren Foundry & Pipe Co. and on 4500 tons by the United States Cast Iron Pipe & Foundry Co. The Pont-a-Mousson works, the Continental cast iron pipe plant that has provided so much competition lately was several dollars higher than the low bidders. The French seller is understood to be heavily booked and, on the smaller sizes, not willing to offer deliveries before May or June. Prices on water and gas pipe are not particularly firm as a result of the competition of the foreign product and determination of the minimum price is difficult. Soil pipe makers report only a light demand and some inclination on the part of certain makers toward concessions.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$52.60 to \$53.60; 4-in. and 5-in., \$57.60 to \$58.60; 3-in., \$67.60 to \$68.60, with \$5 additional for Class A and gas pipe. Discounts on both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 40 to 41¼ per cent off list; heavy, 50 to 51¼ per cent off list.

**Coke.**—Return to the 1917 wage scale by independent Connellsville operators is virtually completed. Those who had not already done so adopted the old scale on March 17, when the Rainey-Wood Coke Co. posted its notice. In the latter case, all hands returned to work and this seems to be general throughout the area. Now that the labor factor is determined, there is a definite basis for reckoning on second quarter business and both buyers and sellers appear less reluctant to figure.

**Old Material.**—Transactions in all grades seem to have reached the minimum of activity. Heavy melting steel is still being shipped in moderate tonnages to Bethlehem and Conshohocken, Pa., and is quotable at \$15.50 to \$16 per ton, delivered, with some brokers offering less than \$15.50 per ton, but obtaining little or no steel at the price. Pipe is inactive and not quotable at more than \$15.50 to \$16 per ton, delivered. A Phoenixville consumer is still accepting machine shop turnings, bundled sheets and stove plate at low prices. Turnings are not quotable at more than \$13, eastern Pennsylvania, and stove plate is \$13.50 per ton, delivered on either a \$3.50 or \$2.02 per ton freight rate. Borings and turnings are steady at \$12 a ton, delivered Bethlehem. Scarcity of transactions still prevails.

Buying prices per gross ton New York follow:

Heavy melting steel, yard.....	\$12.00 to \$12.50
Heavy melting steel, railroad or equivalent .....	12.50 to 13.00
Rails for rolling.....	15.00 to 15.50
Relaying rails, nominal.....	24.00 to 25.00
Steel car axles.....	18.50 to 19.00
Iron car axles.....	24.00 to 24.50
No. 1 railroad wrought.....	14.50 to 15.00
Forge fire .....	10.00 to 10.50
No. 1 yard wrought, long.....	13.50 to 14.00
Cast borings (steel mill).....	10.50 to 11.00
Cast borings (chemical).....	15.50 to 16.00
Machine shop turnings.....	9.50 to 10.50
Mixed borings and turnings.....	9.00 to 10.00
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	11.75 to 12.25
Stove plate .....	10.50 to 11.00
Locomotive grate bars.....	12.00 to 12.50
Malleable cast (railroad).....	15.00 to 15.50
Cast iron car wheels.....	14.75 to 15.25
No. 1 heavy breakable cast.....	12.50 to 13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$16.00 to \$16.50
No. 1 heavy cast (columns, building materials, etc.), cupola size .....	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.) .....	13.00 to 13.50



## Birmingham

### Outlook for Steel More Favorable—Pig Iron Market Is Dull

BIRMINGHAM, ALA., March 17.—Sales are slow and in small lots, inquiries a little more active, deliveries very steady; in fact, greater than the make, so far as foundry iron is concerned, surplus stock being reduced and quotations being held firm at \$22 per ton, No. 2 foundry. The unfilled tonnage is considerable and the small-lot sales are adding to the orders in hand. Surveys of the various iron using industries show that there will be active operations at many of them indefinitely and while there is much iron, either on yards or to be delivered, further tonnage will be required. Reports as to the sales of round tonnages recently still are heard, but there is no verification. The furnace interests manifest confidence in the future market. The waiting game, as it has been termed, is being played by both sides, consumers holding off from buying and producers holding off from reducing quotations.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows, the lower prices being for first quarter and the higher those of the largest producers for second quarter:

No. 2 foundry, 1.75 to 2.25 sil...	\$21.50 to \$22.00
No. 1 foundry, 2.25 to 2.75 sil...	22.00 to 22.50
Basic .....	21.00 to 22.00
Charcoal, warm blast.....	30.00

**Steel.**—Better feeling is shown in the Southern steel market as fabricators report improved conditions, contracts coming in and some large specifications in sight. The R. I. Ingalls Iron Works Co., the Southern Steel Co. and other fabricators report numerous small contracts in the immediate vicinity, with adjoining States offering much business, but competition very keen. The Ingalls plant is completing shipments on steel for sugar plants in Camagui Province, Cuba, and in Brazil. Completion of shipments of structural steel into Mexico is also announced. The machinery for the Cuban sugar plant is being rushed by the Birmingham Machine & Foundry Co. The steel contracts mentioned amounted to more than 2000 tons. Future needs for steel warrant the early completion of the new steel plant of the Tennessee Coal, Iron & Railroad Co., which is to be finished early in April. This plant has four open-hearth furnaces. All Steel Corporation plants in operation are still going at near capacity, while the Gulf States Steel Co. has four out of six open-hearth furnaces in operation. Soft steel bars are quoted in this district at 2.25c. to 2.35c.

**Pipe.**—All cast iron pressure pipe makers in this district have recently been piling up orders and an estimate is made that 20,000 to 30,000 tons of pipe will hardly touch the late bookings. The plants will have warrant for active production indefinitely and shipments will have to be steady. The quotations are still on a \$40 per ton base, 6-in. and over. Production will be increased by an addition to the McWane plant before May 1.

**Scrap.**—The scrap iron and steel market shows no life at all as to new business. Deliveries are not active, either, consumers showing no anxiety to have the stock delivered. While quotations are very weak, no further reduction was noted the past week. Heavy melting steel is down to \$14, with no demand. The old material dealers look for no improvement for 30 days at least, sales during the first two months of the year being sufficient to care for needs for a while yet.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical....	\$15.00 to \$16.00
Heavy melting steel.....	14.00 to 15.00
Railroad wrought .....	13.00 to 14.00
Steel axles .....	15.00 to 16.00
Iron axles .....	19.00 to 20.00
Steel rails .....	14.00 to 15.00
No. 1 cast.....	17.00 to 17.50
Tramcar wheels .....	17.00 to 17.50
Car wheels .....	16.00 to 17.00
Stove plate .....	14.50 to 15.50
Machine shop turnings.....	8.00 to 9.00
Cast iron borings.....	8.00 to 9.00
Rails for rolling.....	16.50 to 17.00

**Coke.**—Considerable coke is selling in the Birming-

ham district, \$5 being the average price, foundry coke. Furnace and steel companies are requiring all the coke they are able to produce themselves, leaving the open market now to the independent companies. All by-product ovens in shape are in operation. The Alabama By-Products Corporation will feel the effects of the addition of 25 ovens to its plant.

## Boston

### Continued Inactivity Has Developed Soft Spots in Pig Iron Market

BOSTON, March 17.—A week ago dullness appeared to lend firmness to pig iron prices, but continued inactivity has developed soft spots. Buffalo iron, heretofore held at \$23 furnace base, has been offered at \$22, and one furnace has taken small tonnages at the latter figure. Buyers claim they are offered Buffalo iron, silicon 2.25 to 2.75, at \$22 furnace, which, if differentials are considered, means \$21.50 furnace base. Eastern Pennsylvania furnace representatives intimate they will shade prices on attractive tonnages. Western Pennsylvania No. 2 plain iron sold on a delivered basis equal to \$21.50 Buffalo furnace, 500 tons being involved. Dutch and Continental, silicon 2.50 to 3.00, is offered freely at \$22 on dock Boston, duty paid, with few takers. Some owners of foreign iron are asking for offers under stress of increasing storage charges. Alabama and Virginia iron prices are maintained, but sales are limited. Something like 90 per cent of New England foundries show no interest in future iron supplies at any price.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$26.65 to \$27.15
East. Penn., sil. 2.25 to 2.75.....	27.15 to 27.65
Buffalo, sil. 1.75 to 2.25.....	26.91 to 27.41
Buffalo, sil. 2.25 to 2.75.....	27.41 to 27.91
Virginia, sil. 1.75 to 2.25.....	29.92
Virginia, sil. 2.25 to 2.75.....	30.42
Alabama, sil. 1.75 to 2.25.....	31.60
Alabama, sil. 2.25 to 2.75.....	32.10

**Warehouse Business.**—Local warehouse prices on plain and deformed concrete bars have been reduced 30c. per 100 lb., and on twisted squares, 10c., the first two now being \$3.26½ and the last \$3.54. Cold-rolled steel has been advanced 10c. per 100 lb., rounds to \$4.15, and squares, hexagons and flats to \$4.65. Warehouses also have issued a new list of extras on steel bands and hoops. Otherwise iron and steel prices are unchanged. Mills have discontinued the practice of selling bolts on a freight allowed basis, having reverted to a Pittsburgh base, which amounts to an advance of about 7 per cent on the average. Warehouses have not changed their prices, being covered on first quarter requirements. They voice considerable opposition to the disallowance of freights.

Boston warehouse prices on iron and steel:

Steel, soft bars \$3.26½ per 100 lb.; flats \$4.15; concrete bars, \$3.26½ to \$3.54; structurals, angles and beams, \$3.36½; plates, ¼-in. and heavier, \$3.36½, ½-in., \$3.56½; tire steel, larger \$4.50, smaller \$4.75; open hearth spring steel, larger flats, \$5, smaller flats, also rounds and squares, \$10; crucible spring steel, \$12; cold rolled rounds, \$4.15, squares, hexagons and flats, \$4.65; toe calk steel, \$8. Iron, refined bars, \$3.26½ per 100 lb.; best refined bars, \$4.60; Wayne, \$5.50; Norway iron rounds, \$6.60, squares and flats, \$7.10.

**Coke.**—Specifications against first half by-product foundry coke contracts the first 15 days of March were considerably less than those for the corresponding period last month and about on a par with those for the first half of January. During the past few days some hurlyburly orders of fuel have come into the market, suggesting a shortage of holdings by foundries. Both the New England Coal & Coke Co. and the Providence Gas Co. quote by-product foundry coke at \$12 a ton delivered in New England.

**Old Material.**—The unwillingness of most sellers to let go old material at prevailing prices has failed to check a still further easing off in values, as a result of a semi-stagnant demand. Mills are buying little, if

any material, consequently brokers' activities are confined largely to a cleaning up odds and ends of old orders. The continued comparatively high rate of steel mill operation gives hope to the old material trade that business will improve the last of this month or in early April.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast .....	\$19.00 to \$20.00
No. 2 machinery cast .....	17.00 to 18.00
Stove plates .....	14.00 to 14.50
Railroad malleable .....	19.00 to 20.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel .....	\$11.50 to \$12.50
No. 1 railroad wrought .....	14.00 to 14.25
No. 1 yard wrought .....	12.00 to 12.50
Wrought pipe (1-in. in diam. over 2 ft. long) .....	11.00 to 11.50
Machine shop turnings .....	8.00 to 8.50
Cast iron borings, chemical .....	13.50 to 14.00
Cast iron borings, rolling mill .....	8.50 to 9.00
Blast furnace borings and turnings .....	8.00 to 8.50
Forge scrap .....	9.50 to 10.75
Bundled skeleton .....	9.50 to 10.75
Bundled cotton ties .....	8.50 to 9.50
Forged flashings .....	9.50 to 10.00
Shafting .....	17.50 to 18.00
Street car axles .....	17.50 to 18.00
Rails for rerolling .....	12.50 to 13.50
Scrap rails .....	11.50 to 12.50

## St. Louis

### Inquiry for Basic Is Only Important Pig Iron Business Pending

ST. LOUIS, March 17.—This has been an extremely dull week in the pig iron market. No sales of consequence have been made and there is only one inquiry pending; that is for 5000 to 10,000 tons of basic iron for an East Side melter. Melters in the district show no interest in their second quarter requirements. They are relying on big production of pig iron and efficient transportation service to enable them to buy supplies as required. The market is nominally unchanged and there is a weaker trend to prices.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Florence and Sheffield (rail and water), \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City.

Northern fdy., sil. 1.75 to 2.25 .....	\$26.16
Northern malleable, sil. 1.75 to 2.25 .....	26.16
Basic .....	26.16
Southern fdy., sil. 1.75 to 2.25 (rail) .....	\$26.17 to 27.17
Southern fdy., sil. 1.75 to 2.25 (rail and water) .....	24.28 to 25.28
Granite City iron, sil. 1.75 to 2.25 .....	25.81 to 26.31

**Finished Iron and Steel.**—Fabricators of structural steel report that business is unusually dull. It has been several months since an order was placed and there is nothing of size pending. Pending reinforcing jobs include the warehouse for the Kroger Grocery Co., 150 tons, and Drury College, Springfield, Mo., 100 tons. The contract for the Standard Sanitary Mfg. Co. warehouse in Indianapolis, 200 to 225 tons, went to U. J. Baker, that city. The 4000 tons of rails placed by the St. Louis Southwestern Railway with the Illinois Steel Co., as reported in the last week's IRON AGE, was the unfilled portion of a contract for 10,000 tons, made three years ago, since when no orders have been placed by that road. Business in other lines is quiet.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, cold rolled, one pass, 4.80c.; galvanized steel sheets, No. 28, 5.80c.; black corrugated sheets, 4.95c.; galvanized, 5.95c.; cold-rolled rounds, shafting and screws stock, 3.95c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets,  $\frac{3}{8}$  in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, \$3.50; hexagons, blank or tapped, \$4 off list.

**Coke.**—There is a very good demand for foundry coke and by-product ovens find it easy to sell their current output. Very little is coming in from the Connellsville district. Domestic coke is extremely quiet.

**Old Material.**—Buying of old material by consumers in the St. Louis district is still very light, although there was a slight improvement last week. Consumers are holding off buying until they actually require the

material. The Rock Island list, 7000 tons, was closed on Thursday. New lists include the following: San Antonio & Aransas Pass, 600 tons; Lenoir Car Works, 1200 tons; Pennsylvania System, 1050 tons of destroyed bridges, and Gulf Coast Line, 400 tons of 45-lb. rails.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

#### Per Gross Ton

Iron rails .....	\$17.50 to \$18.00
Rails for rolling .....	19.00 to 19.50
Steel rails less than 3 ft. ....	20.00 to 20.50
Relaying rails, 60 lb. and under ..	25.00 to 26.00
Relaying rails, 70 lb. and over ..	32.50 to 33.50
Cast iron car wheels .....	17.50 to 18.50
Heavy melting steel .....	16.50 to 17.00
Heavy shoveling steel .....	16.50 to 17.00
Frogs, switches and guards cut apart .....	17.50 to 18.00
Railroad springs .....	20.00 to 20.50
Heavy axles and tire turnings ..	13.00 to 13.50
No. 1 locomotive tires .....	19.00 to 19.50

#### Per Net Ton

Steel angle bars .....	16.00 to 16.50
Steel car axles .....	19.50 to 20.00
Iron car axles .....	25.50 to 26.00
Wrought iron bars and transoms ..	19.50 to 20.50
No. 1 railroad wrought .....	14.50 to 15.00
No. 2 railroad wrought .....	15.25 to 15.75
Cast iron borings .....	12.50 to 13.00
No. 1 busheling .....	13.00 to 13.50
No. 1 railroad cast .....	18.00 to 18.50
No. 1 machinery cast .....	19.00 to 19.50
Railroad malleable .....	16.00 to 16.50
Machine shop turnings .....	8.50 to 9.00
Champion bundled sheets .....	9.50 to 10.00

## Buffalo

### Despite Weakness of Prices, Furnace Operators Are More Optimistic

BUFFALO, March 17.—Inquiry for the week was between 5000 and 7500 tons with a 2000-ton inquiry for malleable from the Gould Coupler Co., the feature. A New Jersey melter sought 750 tons of foundry and one of the others was for 500 tons. The International Harvester Co. has an inquiry out for 400 tons of malleable and this is said to have been placed. The Eastern Malleable Iron Co. sought 100 tons of malleable. The Massey-Harris Company has covered for 2000 tons of foundry. The price situation is not any stronger—in fact, weaker, but there is a growing tendency that indicates furnaces are tiring of the low prices and will accordingly blow out rather than continue to compete for iron at \$21.50 and \$22. The Rogers-Brown Iron Co., which had four furnaces blowing, has banked two fires during the week and the Hanna Furnace Co. will blow out one furnace before April 1. This will take out of Buffalo production nearly 45,000 tons a month. While furnaces are endeavoring to get \$22 and \$23 for No. 2 plain and malleable, users are trying to place business at considerably under these figures. On sizable inquiries, the users offer \$21.50 and even \$21, and while it is not known definitely that these figures were accepted, it is known that these particular tonnages were placed. In spite of the declining market, furnace-men believe that they are now developing a good strategic position and are optimistic.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25 .....	\$21.50 to \$22.00
No. 2X foundry, sil. 2.25 to 2.75 ..	22.00 to 23.00
No. 1 foundry, sil. 2.75 to 3.25 ..	23.00 to 24.00
Malleable, sil. up to 2.25 .....	21.50 to 22.50
Basic .....	22.00
Lake Superior charcoal .....	29.28

**Finished Iron and Steel.**—Mixed sentiment as to the future of the market is apparent. No changes have taken place in prices except that the Buffalo delivered price of 2.465c. on bars and shapes has gone into the discard and 2.365c. is quoted on what business is offering. This price is firm. Reinforcing bar jobs let recently are the Superior and Marine elevators to James Stewart Co. of Chicago. The Washburn-Crosby elevator, requiring 700 to 800 tons, is pending. A Knights of Columbus building in Rochester will require 100 tons of reinforcing bars. Warehouse prices follow:

Warehouse prices are being quoted as follows: Steel bars, 3.30c.; steel shapes, 3.40c.; steel plates, 3.50c.; No. 10 blue annealed sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.85c.; cold rolled shapes, 4.70c.; cold rolled rounds, 4.20c.; wire nails, 4.00c.; black wire, 4.05c.



**Old Material.**—The market is quieter than last week with further softening of prices. One Buffalo mill announces that it can purchase all the surplus scrap it needs for a price considered somewhat low. This mill, it is stated, can buy heavy melting steel for \$16.75. Another mill which has been offering \$18 for strictly No. 1 steel is reported to have paid that price on its latest purchases. Stocks of scrap held in mill yards now, it is claimed, are sufficient to last mills at their present pace of operations for a considerable time. The percentage of rejections by local mills is very high, all dealers being held to a pretty stiff standard. Dealers are selling at market without any attempt to hold back, a feature which is rather puzzling to observers. Specialty demand is light. An occasional car of short rails or angle bars is sold, but there is practically an absence of demand for low phosphorus.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel .....	\$17.00 to \$17.50
Low phosphorus .....	19.00 to 20.00
No. 1 railroad wrought .....	15.00 to 15.50
Car wheels .....	18.50 to 19.50
Machine shop turnings .....	12.50 to 13.00
Cast iron borings .....	12.50 to 13.00
No. 1 busheling .....	16.25 to 16.75
Stove plate .....	16.00
Grate bars .....	13.00 to 13.50
Bundled sheets .....	12.50 to 13.00
Hydraulic compressed .....	16.50 to 17.00
Railroad malleable .....	19.00 to 20.00
No. 1 cast scrap .....	17.50 to 18.00
Iron axles .....	27.00 to 28.00
Steel axles .....	17.50 to 18.00

## Cincinnati

### Pig Iron Market Dull with Weakness in the Ironton District

CINCINNATI, March 17.—Weakness still characterizes the local pig iron market. Buyers are hesitant about placing orders for second quarter delivery and are holding off in the belief that they will be able to secure more favorable prices and also prompt shipment when desired. Consumers are not inclined to hold up shipments and they are accepting tonnages according to contract specifications. Second quarter business that has been placed is negligible. Dealers, however, feel that conditions are favorable for increased activity shortly. Several southern Ohio furnaces are reported to be piling iron because of scarcity of orders. The furnace of the Belfont Iron Works, Ironton, Ohio, now banked, is expected to go into blast again about April 1. Sales of Northern iron have been small with two exceptions. The Standard Sanitary Mfg. Co., Pittsburgh, purchased 5000 tons of Northern iron at Ironton and 8000 tons of Southern for second quarter shipment to its Louisville plant. A southern Ohio manufacturer bought 2200 tons of Northern foundry iron for second quarter shipment. There have been only a few inquiries. An Indianapolis manufacturer is in the market for 1000 tons of Northern foundry iron for second quarter delivery. The top price for Northern iron in the Ironton district has decreased 50c., dropping from \$23, furnace, to \$22.50. Prices of Southern iron are largely nominal in view of the lack of sales to test the market. Tennessee iron is quoted at \$20.50 and \$21, Birmingham, although it is conceded that if any sizable business developed the selling price probably would be \$20, Birmingham. Alabama iron is quoted at \$22, Birmingham, but this is also a nominal figure. A central Ohio manufacturer is asking for a car of 50 per cent lump ferrosilicon for immediate delivery. The Bucyrus Co., Milwaukee, Wis., is in the market for 100 tons of off iron for its Evansville, Ind., plant.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., sil. 1.75 to 2.25 (base) .....	\$24.05 to \$25.05
Southern fdy., sil. 2.25 to 2.75 .....	24.55 to 25.55
Southern Ohio silvery, 8 per cent .....	\$2.77
Southern Ohio fdy., sil. 1.75 to 2.25 .....	24.02 to 24.77
Southern Ohio, basic (nominal) .....	24.27
Southern Ohio malleable .....	24.27 to 25.27

**Structural Steel.**—Building activities have not opened up extensively and the market for structural steel has been quiet. The Ralston Steel Car Co., Co-

lumbus, Ohio, awarded a contract to the Massillon Bridge Co. for a job requiring approximately 150 tons. There are no inquiries at present involving large tonnages. The only job in Cincinnati territory on which leading companies are bidding is for 150 tons for the Union Gas & Electric Co., Cincinnati. Prices remain steady at 2.20c., Pittsburgh, for second quarter business and 2.10c., Pittsburgh, for immediate business.

**Reinforcing Bars.**—The market is quiet, although there are several jobs pending which will be awarded within the next few weeks. The Phelps Apartments, Cincinnati, will take about 600 tons while the Children's Home calls for 300 tons. No award has been made yet for the Cheviot School, Cheviot, Ohio, about 100 tons. Bids will be taken shortly by Tietig & Lee, Cincinnati architects, for a 7-story hotel on Garfield Place, Cincinnati, about 100 tons. Construction work is slow in getting started locally, but it is expected that considerable business will be developed in the next several months. Prices are firm at 2.10c., mill.

**Tin Plate.**—Gradual improvement is noted in the Cincinnati market. Increasing consumption of tin plate is reported as the canning season draws nearer. Shipments on contract are going ahead nicely. The price is firm at \$5.50 per base box, Pittsburgh.

**Sheets.**—Activities in sheets have fallen off in the past week and sales are not so large in volume as during the previous week. Buyers are conservative and are purchasing only sufficient stock to fill their immediate requirements. Little second quarter business is being booked at present. Inquiries have been limited and the market, considered as a whole, is quiet. Companies, however, are optimistic and feel that the second quarter will bring increased activities. Jobbers report that their sales have been fair. Prices are showing signs of weakness. Black sheets are quoted at 3.70c., Pittsburgh, but there is practically no business being placed at this figure, the prevailing price being 3.60c. Galvanized sheets are quoted at 4.85c., Pittsburgh, but are obtainable at 4.75c. Blue annealed sheets are bringing 2.70c. and auto sheets 4.60c. There is little activity recorded in auto sheets, both sales and inquiries being few.

**Warehouse Business.**—Sales continue at about the same level as prevailed during February and the first week of March. One of the large companies reports that its business during the past week showed a gratifying increase and that if sales do not fall off perceptibly during the latter part of the month March will be one of the best months experienced in several years. Buyers, however, are still cautious and are not anticipating future needs, confining their purchases to immediate needs. Prices are firm at the same figures that prevailed a week ago.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, \$3.25 per 100 lb.; common wire nails, \$3.25 per keg base; cement coated nails, \$2.65 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list.

**Finished Materials.**—The market was spotty during the past week. Some companies reported that sales were fairly good and others stated that business had decreased as compared with the previous week. Consumers are inclined to push the mills for speedy delivery. There is a gradual increase in the amount of second quarter business being booked, but it has not assumed formidable proportions. There are some sales being made at the quoted price of 2.20c., Pittsburgh, but practically all of these are for second quarter delivery. Consumers are well covered for the first quarter at the old price of 2.10c., Pittsburgh. It is thought that by the beginning of the second quarter the 2.20c., Pittsburgh, price will be well established. The market for wire products has been quiet and, as a result, prices are weak. Plain wire is quoted at 2.70c., Pittsburgh, but sales are being made at 2.60c., Pittsburgh. Although nails are quoted at 2.95c., Pittsburgh, practically no business has been done at this

figure, but it has served the purpose of firmly establishing the market at 2.85c., Pittsburgh. Track fastenings are quiet, although there is a fair volume of inquiries. Little demand is evidenced for light rails.

Connellsville furnace, \$3.50 to \$4.00; foundry, \$4.25 to \$5.50; New River foundry, \$3.00 to \$3.50; Wise County furnace, \$4.00 to \$5.00; foundry, \$4.50 to \$6.00; by-product foundry, \$6.50 Connellsville basis.

**Coke.**—The coke market is showing little activity. Demand from domestic market has declined during the past week. Prices are fairly firm with no changes recorded. Foundry coke has been quiet.

**Old Material.**—The scrap market is weak. Consumers bought little during the past week and dealers have only a few inquiries on hand. While mills are holding off in placing business, dealers are accumulating considerable quantities of material. The Louisville & Nashville closed its list the past week, some of the material being purchased locally. The Southern, Norfolk & Western and Chesapeake & Ohio are closing their lists this week. Prices are weaker and reductions have been made on certain items.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel.....	\$14.50 to \$15.00
Scrap rails for melting.....	14.50 to 15.00
Short rails.....	18.00 to 18.50
Relaying rails.....	29.50 to 30.00
Rails for rolling.....	16.00 to 16.50
Old car wheels.....	14.00 to 14.50
No. 1 locomotive tires.....	17.00 to 17.50
Railroad malleable.....	16.50 to 17.00
Agricultural malleable.....	15.00 to 15.50
Loose sheet clippings.....	11.50 to 12.00
Champion bundled sheets.....	12.50 to 13.00
Per Net Ton	
Cast iron borings.....	10.50 to 11.00
Machine shop turnings.....	10.00 to 10.50
No. 1 machinery cast.....	18.50 to 19.00
No. 1 railroad cast.....	15.50 to 16.00
Iron axles.....	22.50 to 23.00
No. 1 railroad wrought.....	12.00 to 12.50
Pipes and flues.....	8.50 to 9.00
No. 1 busheling.....	10.50 to 11.00
Mixed busheling.....	9.50 to 10.00
Burnt cast.....	10.50 to 11.00
Stove plate.....	11.00 to 11.50
Brake shoes.....	12.00 to 12.50

## San Francisco

### Little New Business—Buyers Hesitant— Prices Practically Unchanged

SAN FRANCISCO, March 14 (By Air Mail).—Little new business has been developed in the Pacific Coast iron and steel market during the past week or ten days. Buyers are still hesitant, and practically all current business is confined to small lots. Prices are practically unchanged, although it is generally conceded that desirable orders can be placed at a lower figure than the prevailing market. There are, however, no large orders being taken today. Sellers insist that there will be no price recession, and that higher quotations are likely for second half business.

A few minor developments, recently, have lent color to rumors that plans are being made to bring into this market, at competitive prices, larger quantities of foreign iron and steel. Dutch pig iron, for instance, has been offered at \$25 c.i.f., duty paid at incoming dock, but no sales are known to have been made at that figure. No large amount of foreign iron has come in recently, but there is a small amount of Dutch foundry iron ready for sale at present in an Oakland yard.

Building construction continues as the one bright spot in present conditions, not only in this locality but throughout the West. A grand total of \$39,615,831 in building permits was issued during February in 76 major cities of the seven Far Western States. San Francisco building permits during February showed an increase of 13 per cent over January.

**Pig Iron.**—Selling is limited to small lots, although a few inquiries have already been made for second half requirements. Little foreign iron is coming in, although there is a quantity available for immediate de-

livery on moderate requirements. Dutch iron, 2.75 to 3.25 silicon, has been offered at \$25 c.i.f., duty paid, incoming dock, but no sales are known to have been closed. There is practically no Indian iron available here at present, most of the foreign iron being English and Continental. Several low quotations have been made in foreign iron recently, as feelers, but it is the general opinion among importers that higher prices may be expected in the near future, except on very desirable tonnages. The price of Columbia iron is firm. Prices are as follows:

*Utah basic.....	\$27.25 to \$28.25
*Utah foundry, sil. 1.75 to 2.25.....	27.50 to 28.50
**Scotch foundry.....	28.00 to 30.00
**English foundry.....	26.00 to 29.00
**Belgian foundry.....	26.00 to 28.00
**Dutch foundry.....	25.50 to 26.50
*Birmingham, Ala., foundry, sil. 2.75 to 3.25.....	31.00

\*Delivered San Francisco.  
\*\*Duty paid, f.o.b. cars San Francisco.

**Ferroalloys.**—One of the large local importers has recently booked several good size orders for Swedish ferrosilicon at \$93, duty paid, incoming dock for May shipment. Some fair size orders have also been placed recently for English ferromanganese at \$117.50, duty paid, incoming dock.

**Shapes.**—Although a number of jobs are pending, recent awards have been comparatively few, and the tonnage has been relatively light. Prices are unchanged at 2.55c. to 2.60c., c.i.f. No large job has come up for figuring during the past week. Brode Iron Works is low bidder in the Club House at Golden Gate Park, about 150 tons.

**Plates.**—Contract has been awarded to the Western Pipe & Steel Co. for the 3000 tons of plates in the Gordon Valley water project, Vallejo, Cal. An unknown Chicago fabricator was awarded 470 tons of universal plates for the Pacific Fruit Express Co., Roseville, Cal., plant. Prices are unchanged, 2.50c. to 2.60c. c.i.f. being the range, although 2.50c. is possible only for a large tonnages. Bids close March 23 for the Oakland-Alameda estuary tube involving about 6400 tons.

**Bars.**—Quotations for soft steel bars remain unchanged at 2.55c. to 2.60c. base. Reinforcing bars are 3.35c., base, carload, and 3.80c., base, l.c.l. The reinforcing bar market is somewhat quiet, although a number of good size jobs are pending. Among the recent awards were the following:

Central National Bank, Oakland, Cal., 270 tons, to Steel Service Corporation.

California State Automobile Association building, San Francisco, 320 tons, to Steel Service Corporation.

Pacific Meter Works, 11th and Bryant Streets, San Francisco, 150 tons, to Gunn, Carle & Co.

Chinese Y. M. C. A., San Francisco, 100 tons to Truscon Steel Co.

**Warehouse Business.**—Prices are slightly stronger, but no increase in the volume of buying has developed. Buyers are placing orders for immediate requirements only. Jobbers look forward to increased activity toward the end of the month.

Merchant bars, \$3.30 base, per 100 lb.; merchant bars,  $\frac{3}{4}$  in. and under, rounds, squares and flats, \$3.80 base, per 100 lb.; soft steel bands, \$4.15 base, per 100 lb.; angles,  $\frac{3}{4}$  in. and larger x  $1\frac{1}{2}$  in. to  $2\frac{1}{2}$  in., inc., \$3.30 base, per 100 lb.; channels and tees,  $\frac{3}{4}$  in. to  $2\frac{1}{2}$  in., inc., \$3.90 base, per 100 lb.; angles, beams and channels, 3 in. and larger, \$3.15 base, per 100 lb.; tees, 3 in. and larger, \$3.30 base, per 100 lb.; universal mill plates,  $\frac{1}{4}$  in. and heavier, stock lengths, \$3.30 base, per 100 lb.; spring steel,  $\frac{1}{4}$  in. and thicker, \$6.30 base, per 100 lb.

**Coke.**—Better interest in small lots has been shown recently, and indications point to a stronger price tone. Importers claim to be experiencing more difficulty in getting shipments because of a slowing down of production in England. Prices follow:

English beehive, \$16 to \$18 at incoming dock, and English by-product, \$14. Birmingham, Ala., by-product, \$18.50 to \$20.50 delivered; West Virginia beehive, \$28 delivered, and Wise County, Va., beehive, \$22 delivered.



## Cleveland

### Ore Prices Not to Be Advanced—Active Buying of Sheets at Low Prices

CLEVELAND, March 17.—A fairly good buying movement in sheets for the second quarter is under way. Several of the larger Detroit automobile companies came in the market during the week and purchased round tonnages of sheets and considerable strip steel. Some round lot business is still pending from the same source. There was also considerable buying of sheets during the week by industries outside of the automobile field. However, this activity has not resulted in any firmer sheet prices. Automobile manufacturers are increasing production and a number of leading Detroit plants are expected to be up to full capacity in April. The spring buying movement in cars is at hand and stocks are apparently low owing to the very limited production during January and February.

Aside from the activity noted above, new demand is rather light. Mills are getting a large number of orders, but mostly in small lots and against existing contracts. It is evident that very little first quarter tonnage bought at lower than prevailing prices will not be specified for before the end of the month. A fair amount of work in the building field is being figured on, but not much other work requiring specific tonnages is coming out. Inquiries have come out for three more large Lake boats which, if placed, will require 15,000 tons of steel. Bids for the Kansas City pipe line requiring 5000 tons of plates will be opened Thursday. The Canton Car Co., Canton, Ohio, has placed 925 tons of plates for Baltimore & Ohio Railroad work. There is virtually no change in the price situation on steel bars, plates and structural material, on which mills are holding firmly to 2.10c. in this market, with some small lots of bars and structural shapes going at 2.20c. Hoops and bands range from 2.40c. to 2.50c., but hot-rolled strip steel in wide material is quoted at 2.30c. to 2.40c. Cold-rolled strip steel is firm at 4c.

**Pig Iron.**—The establishment of a \$21 price on foundry iron in the Valley district by a round lot purchase by the Standard Sanitary Mfg. Co. has resulted in some further downward readjustment of prices by Lake furnaces. This company late last week bought a round tonnage of Southern foundry iron for its Louisville plant for the second quarter at a reported price of \$20.50. One producer has made a 50c. reduction to \$22 on foundry and malleable iron. In the absence of inquiries, local furnaces have not named definite prices for outside shipment, but will meet the price situation as developed in the Valley district. For Cleveland delivery some small lot business has been booked at \$23 at furnace, but as this price is well above price of Valley iron delivered Cleveland, somewhat lower quotations probably would be named on an inquiry of sufficient size to develop competition. In Michigan, foundry iron is quoted at \$22.50, a decline of 50c. a ton. Weakness has developed in Ohio silvery iron, which has sold at \$29.50 for 8 per cent, or \$1 a ton below the regular schedule, and even lower quotations are reported. Low phosphorus iron has declined 50c. a ton to \$28.50 on a small lot sale, and this price might be shaded. Sales during the week were light. However, some producers report a slight improvement in inquiry. One interest has inquiries for 7000 to 8000 tons of foundry and malleable iron, one for 1000 tons from an Indiana melter and the remainder from widely scattered sources.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace.....	\$21.50
N'th'n No. 2 fdy., sil. 1.75 to 2.25.....	\$23.25 to 23.50
Southern fdy., sil. 1.75 to 2.25.....	26.01 to 27.01
Malleable.....	23.25 to 23.50
Ohio silvery, 8 per cent.....	32.52 to 33.52
Standard low phos., Valley furnace.....	28.50

**Iron Ore.**—Ore producers have given up expectations of getting higher prices for Lake Superior ore this season and are now exerting their efforts to keep prices from going below those that prevailed last year. Early in the year, when conditions in the iron and steel industry were better than they are today, ore men were talking of a 50c. to 80c. advance on ore, many expecting an 80c. per ton advance that would bring prices back to where they stood before last year's cut. Declining pig iron prices are causing a sentimental weakness in the market. When ore prices were fixed early last April for 1924, pig iron in the Valley district was 50c. to \$1 a ton higher than today. Heavy pressure for lower priced ore is being exerted by some steel plants and blast furnaces, which have been assisted in the past few years by ore producing interests in carrying out financing plans, and as a part of these refinancing deals these consumers made term contracts for ore at the regular market price for each season. These producers now find themselves unfavorably situated as compared with others who have more favorable term contracts for ore and claim they will be unable to meet competition unless they buy ore about as cheap as their competitors. Ore has been offered at even lower than last season's prices, but only for term contracts and not by any large producers. Some consumers, apparently believing that the low point may have been reached in pig iron prices and that a buying movement may come and cause some reaction upward and a firmer feeling in ore, are pressing producers to name ore prices, but it seems doubtful whether prices will be established before April.

**Semi-Finished Steel.**—The deadlock between producers and consumers of sheet bars over second quarter prices continues with sheet mills trying to buy at around \$2 a ton below the \$39 asking price. It is claimed that with the present sheet prices, mills in order to make a fair profit should buy sheet bars at not over \$35. While several second quarter inquiries have come out, many sheet mills will carry over into that quarter considerable sheet bar tonnage bought at \$37.

**Sheets.**—Prices appear to have reached bottom in the buying a few weeks ago by Detroit automobile companies, as no lower quotations are reported on business coming from the same source the past week. On the other hand, sheets appear to be fairly plentiful at the minimum prices and the market shows no signs of strengthening. Detroit automobile companies bought round lots of black sheets the past week at 3.30c. and the price range on this grade is up to 3.60c. On galvanized sheets there is a range of from 4.60c. to 4.75c., with the lower price more common. Some round-lot business has been taken at 4.60c., Cleveland. Blue annealed sheets are steady at 2.70c. On auto body sheets 4.50c. now appears to be the maximum price.

**Reinforcing Bars.**—Small lot business has improved but competition is very keen and there is evidence that the 2.10c. price is being shaded on new billet steel bars in good lots. Rail steel bars lack strength and are no longer above 1.90c. for a round lot and quotations of 1.85c. appeared. The Bourne-Fuller Co. has taken 300 tons for the Central Police Station, Cleveland.

**Bolts, Nuts and Rivets.**—Specifications for bolts and nuts picked up somewhat the past week from both jobbers and consumers, and some contracts were placed for the second quarter at the regular 50, 10 and 10 per cent discount. So far makers claim to have been able to hold to 5 per cent higher prices for less than car lots, but jobbers are exerting pressure to get less than car lots at car lot prices. Rivets are quiet. Small rivets are weak, and a quotation of 70, 10 and 10 per cent off list and even a higher discount has been made for the second quarter.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 2.45c. to 2.60c.; cold-rolled rounds, 4c.; flats, squares and hexagons, 4.50c.; hoops and bands, 2.85c.; No. 9 annealed wire, \$2.25 per 100 lb.; No. 9 galvanized wire, \$3.70 per 100 lb.; common wire nails, \$3.25 base per 100 lb.

**Coke.**—Some second quarter inquiry for furnace coke is pending, and as low as \$3.40 has been quoted on contracts. Quotations on standard Connellsville foundry coke range from \$4.25 to \$5.50. Ohio by-product foundry coke is quoted at \$6.50 Painesville.

**Old Material.**—A Cleveland consumer during the week purchased 15,000 to 20,000 tons of machine shop turnings. Some of these were bought from Detroit automobile companies at \$11.50 or \$14.53, delivered Cleveland. The remainder was bought from dealers, a small portion at \$14.50 and the bulk of the tonnage at \$15 delivered. However, any strengthening effect this purchase might have had on the market was largely counteracted by the suspension of shipments of all grades of scrap by another Cleveland consumer. While prices are unchanged, the market shows signs of weakness, and although quotations have not changed for two weeks, further declines are regarded as probable. There is more evidence of selling pressure than there has been recently, although the volume of material that is being offered is not large.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$16.50 to \$16.75
Rails for rolling.....	17.50 to 17.75
Rails under 3 ft.....	19.00 to 19.50
Low phosphorus melting.....	19.00 to 19.50
Cast iron borings.....	14.00 to 14.25
Machine shop turnings.....	14.25 to 14.50
Mixed borings and short turnings.....	13.75 to 14.00
Compressed sheet steel.....	14.50 to 14.75
Railroad wrought.....	13.50 to 13.75
Railroad malleable.....	19.50 to 20.00
Light bundled sheet stampings.....	12.25 to 12.50
Steel axle turnings.....	14.75 to 15.00
No. 1 cast.....	18.75 to 19.25
No. 1 busheling.....	13.75 to 14.00
Drop forge flashings.....	12.50 to 12.75
Railroad grate bars.....	14.50 to 14.75
Stove plate.....	14.50 to 14.75
Pipes and flues.....	10.50 to 11.00

## Philadelphia

### Dullness in Steel and Pig Iron Markets Brings Easier Prices

PHILADELPHIA, March 17.—The dullness of the steel and pig iron markets, which almost resembles that of midsummer, has brought definitely easier prices not only on pig iron but on plates and structural shapes. The sales of fairly large lots of foundry iron the week before last at \$23, furnace, for the base grade have established the market at that level even for smaller lots, but there is very little buying of any kind. Plates have settled to 2c., Pittsburgh, except on very small lots, although some mills still adhere to 2.10c. Structural shapes have been sold at 2c., Pittsburgh, and in a few isolated instances at 1.95c., Pittsburgh basis. As is usual when consumers are not actively buying, there is a degree of pessimism that probably is not warranted. While not many of the Eastern mills are engaged at more than 50 per cent of capacity, orders have been coming in during the past week or two at a slightly better rate. Plate business, in particular, is a little better than in the preceding one or two weeks. Specifications on contracts are coming in fairly well, though here and there are evidences that consumers over bought, or at least anticipated an expansion in their own businesses which has not in all instances materialized.

**Pig Iron.**—Eastern furnaces are now generally quoting foundry iron on the basis of \$23, furnace, for the base grade, No. 2 plain. While this price has not been quoted on all inquiries of the past week, the furnaces have recognized it as the level to which they would have to go to close any desirable business. As a matter of fact, there has been very little business, desirable or otherwise. Foreign iron continues to come

in in round lots, last week's arrivals totaling 6525 tons, and it prominently figures in nearly every transaction.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rate varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$23.76 to \$24.63
East. Pa. No. 2X, 2.25 to 2.75 sil.	24.26 to 25.13
East. Pa. No. 1X.....	25.26 to 26.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 29.67
Virginia No. 2X, 2.25 to 2.75 sil.	29.67 to 30.17
Basic delivered eastern Pa.....	23.75 to 24.25
Gray forge.....	23.50 to 24.50
Malleable.....	24.50 to 25.00
Standard low phos. (f.o.b. furnace).....	25.00 to 26.00
Copper bearing low phos. (f.o.b. furnace).....	25.00 to 26.00
Various grades of foreign pig iron are being offered at approximately the prices quoted below, all quotations being f.o.b. cars, Philadelphia:	
Indian foundry iron, 2 to 2.50 per cent sil.....	\$23.50 to \$24.00
Indian foundry iron, 2.25 to 3 per cent sil.....	24.00 to 24.50
English foundry iron, 2 to 2.50 per cent sil.....	23.00 to 23.50
Continental foundry, 2.50 to 3 per cent sil.....	23.00 to 23.50
English low phos., copper free...	26.00

**Ferroalloys.**—With no sales reported, ferromanganese continues at \$115, seaboard or furnace.

**Billets.**—There is very little demand for billets and prices are nominal at \$37.50, Pittsburgh, for rerolling quality and at \$42.50 for forging quality.

**Plates.**—Eastern plate mills put slightly more business on their books last week, both in the form of new orders and specifications on contracts, the latter predominating. Prices are not strong, however, and an increased number of sales are being made at 2c., Pittsburgh. All mills are not making this price, some still holding to 2.10c., but 2c. is now sufficiently common to make it difficult to obtain the higher figure.

**Structural Shapes.**—The tendency of structural steel prices is to slide back to 2c., Pittsburgh, the figure at which most of the first quarter contracts were made. During the past week or so a number of jobs have been closed on a 2c. basis, and in a few instances 1.95c., Pittsburgh, has been done. Bids were opened Tuesday by the city of Philadelphia on the third section of the Broad Street subway, calling for 14,000 tons of steel. Buildings to be erected at League Island for the Sesqui-Centennial Exposition in 1926 will take large tonnage of structural steel and concrete reinforcing bars, but these projects have not yet come into the market.

**Bars.**—In bars there is a degree of firmness not found in other hot-rolled products. Apparently all mills are holding rigidly to 2.10c., Pittsburgh, and consumers do not seem to hesitate at this price in covering in a moderate way for second quarter requirements. Bar iron is dull and is quoted at 2.28c., delivered Philadelphia.

**Sheets.**—Not much business is being done in sheets and prices are not strong at 2.70c. for blue annealed, 3.50c. for black and 4.75c. for galvanized, Pittsburgh basis.

**Warehouse Business.**—Local warehouses have reduced the price on hoops to 4.20c., base. On bands the local warehouses are now naming the new mill extras. Following are the prices quoted for local delivery:

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 3.10c.; tank steel plates, ½ in., 3.25c.; blue annealed steel sheets, No. 10 gage, 3.85c.; black sheets, No. 28 gage, 4.85c.; galvanized sheets, No. 28 gage, 6c.; square, twisted and deformed steel bars, 2.85c.; structural shapes, 3.10c.; diamond pattern plates, ¼ in., 5.30c.; ½ in., 5.50c.; spring steel, 5c.; round cold-rolled steel, 4.15c.; squares and hexagons, cold-rolled steel, 4.65c.; steel hoops, 4.20c. base; steel bands, No. 12 gage to ¼ in., inclusive, 3.95c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 7c.

**Old Material.**—Scrap brokers and dealers believe that prices have gone as low as they will go at this time, but they are not yet predicting an upward movement. Yard dealers are paying \$16.50 for good steel scrap to put into their yards, and it is probable that a mill coming into the market now would have to pay not less than \$17. However, there is no mill buying



and the market is still quotable at \$16 to \$16.50. Other grades have held at about the prices of a week ago. There has been very little activity in any line, though fair purchases of No. 1 forge fire have brought quotations in that grade of \$14.50 to \$15.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$16.00 to \$16.50
Scrap rails .....	16.00 to 16.50
Steel rails for rolling.....	18.50 to 19.00
No. 1 low phos. heavy 0.04 and under .....	20.00 to 21.00
Couplers and knuckles.....	20.00 to 21.00
Rolled steel wheels.....	20.00 to 21.00
Cast-iron car wheels.....	18.50 to 19.00
No. 1 railroad wrought.....	19.00 to 19.50
No. 1 yard wrought.....	17.50 to 18.50
No. 1 forge fire.....	14.50 to 15.00
Bundled sheets (for steel works)	
Mixed borings and turnings (for blast furnace use).....	12.50 to 13.00
Machine shop turnings (for steel works use).....	13.50
Machine shop turnings (for rolling mill use).....	14.00
Heavy axle turnings (or equivalent) .....	14.50 to 15.50
Cast borings (for steel works and rolling mill) .....	14.00 to 14.50
Cast borings (for chemical plants) .....	18.50 to 19.00
No. 1 cast.....	18.00 to 19.00
Heavy breakable cast (for steel plants) .....	16.00 to 16.50
Railroad grate bars.....	14.00
Stove plate (for steel plant use) .....	14.00
Wrought iron and soft steel pipes and tubes (new specifications) .....	16.00 to 16.50
Shafting .....	22.00 to 23.00
Steel axles .....	22.00 to 23.00

**Imports.**—Pig iron imports at this port last week included 3075 tons from Germany, 2500 tons from British India, 200 tons from Belgium and 750 tons from England. Ferromanganese from England amounted to 250 tons. Manganese ore from British Africa amounted to 2975 tons and there was 2500 tons of chrome ore from Portuguese Africa. Steel and iron imports included 368 tons of structural shapes from Belgium, 350 tons of blooms from Belgium, 251 tons of steel bars from Belgium and 45 tons of bars from Sweden.

## LUXEMBURG IRON PRODUCTION

### 34 Blast Furnaces Active, Producing 197,430 Tons in January—Steel Output, 170,856 Tons

LUXEMBURG, Feb. 26.—Furnaces in blast on Jan. 31, 1925:

A. R. B. E. D.: 6 at Esch (out of 6), 6 at Dudelange (out of 6), 2 at Dommeldange (out of 3).

Terres Rouges: 6 at Belval (out of 6), Esch idle. H. A. D. I. R.: 8 at Differdange (out of 10), Rumelange idle.

Rodange: 4 (out of 5).

Steinfort: 2 (out of 3).

Production of pig iron and steel of the Grand Duchy of Luxembourg in January was:

Pig Iron		Steel	
	Metric Tons		Metric Tons
Basic .....	191,370	Basic .....	169,397
Foundry .....	6,060	Open-hearth .....	791
		Electric .....	668
Total .....	197,430	Total .....	170,856

### Nearly \$1,500,000 Paid to Workers

With the distribution of \$573,539.97 to the rank and file of the National Cash Register Co.'s factory and office employees, Frederick B. Patterson, president of the company, announced that a total of \$1,490,711.26 had been paid to the workers as additional compensation, based on the company's earnings for the year 1924.

Distributions based on estimated profits are made at the end of the first six months and at the end of the year.

In a discussion of the profit-sharing plan, Mr. Patterson said:

"Profit-sharing makes employees realize that they are partners in the business; and this results in reduced labor turnover, closer cooperation, increased production, decreased waste of material, time and labor, and other benefits. If universally adopted I believe it would go, perhaps, farther than anything else to bridge the gap between capital and labor."

## CANADIAN COMMERCE

### Imports and Exports of Iron and Steel Lower in 1924 Than in Preceding Year

TORONTO, ONT., March 15.—In the calendar year 1924 imports into Canada reached a total of \$808,174,573, as compared with \$903,030,515 for the year 1923. Canadian exports of merchandise, etc., for the year 1924 amounted to \$1,070,611,616, which compares with \$1,028,529,123 for the corresponding period of 1923. Of the total imports for the year \$137,979,471 came under the head of iron and steel and their products, compared with \$173,720,299 for the year 1923, while of this amount \$117,291,590 was imported from the United States during 1924 and \$152,854,567 in 1923. Exports of iron and steel and their products for the year amounted to \$58,621,047 in 1924, compared with \$65,035,808 in 1923, of which \$5,843,758 was exported to the United States in 1924 and \$10,131,638 worth during the year 1923.

During the year under review Canadian imports of iron ore amounted to 912,730 tons, compared with 1,972,092 tons in 1923; of the iron ore imports 694,609 tons were from the United States in 1924 and 1,318,532 tons in 1923. Pig iron and kentledge imports during 1924 reached a total of 34,386 tons, of which 28,812 tons were from United States producers, this compared with a total of 37,955 tons in 1923, of which 23,158 tons came from the United States. A decided slump in exports of iron ore and pig iron is shown in the figures for the year 1924, as compared with those of the previous year. In 1924 iron ore exports amounted to 4932 tons, compared with 8076 tons in 1923, of which 4930 tons went to the United States during the past 12 months, compared with 8078 tons in 1923. Exports of pig iron for 1924 amounted to 16,740 tons, of which 16,656 tons were shipped to the United States, compared with total exports for 1923 of 60,799 tons, of which 60,754 went to the United States.

In non-ferrous metal products Canada's trade for the year shows very little change from that of the previous year. Non-ferrous imports for the year 1924 amounted to \$41,660,085, compared with \$42,431,222 in 1923, of this \$34,081,128 was imported from the United States in 1924 and \$35,233,147 in 1923. Non-ferrous exports for the year 1924 amounted to \$84,780,015, of which \$55,143,131 was shipped to the United States, compared with total exports of \$55,814,055 in 1923, of which \$37,877,814 went to the United States.

### World Production of Coal in 1924

Figures of the United States Geological Survey place the world production of coal in 1924 at 1,350,000,000 metric tons, compared with 1,359,000,000 tons in 1923, 1,226,200,000 tons in 1922 and 1,366,000,000 tons in 1913, which was the highest tonnage ever reported. The United States accounted for 39 per cent of the total in 1924, compared with 44 per cent in 1923 and 36 per cent in 1922. Output of the principal producing countries for the three most recent years is given as follows, in thousands of metric tons:

	1924	1923	1922
United States, bituminous....	438,420	511,792	333,072
United States, anthracite....	82,000	84,675	49,407
Great Britain and Ireland....	273,453	280,430	253,413
Germany, coal .....	118,329	62,225	129,945
Germany, lignite .....	124,340	118,249	137,207
France .....	44,955	38,544	32,582
Czecho-Slovakia .....	34,866	28,613	29,629
Poland .....	32,000	36,296	24,195
Belgium .....	23,260	22,922	31,209
Japan .....	30,000	30,751	29,230
British India .....	20,524	19,973	19,316
Canada .....	11,900	15,413	13,751

### Lebanon Iron Co. Elects

The Lebanon Iron Co., Lebanon, Pa., has elected Howard Longstreth president, succeeding A. H. Beale, who recently became head of the A. M. Byers Co. Mr. Longstreth was formerly secretary. H. W. Pratt has been elected secretary-treasurer and J. J. McDermott is assistant treasurer.

# Prices of Finished Iron and Steel Products (Carload Lots)

## Tank Plates

F.o.b. Pittsburgh mill, base, per lb.....2c. to 2.10c.  
F.o.b. Chicago, base, per lb.....2.30c.

## Structural Shapes

F.o.b. Pittsburgh mills, base, per lb.....2.10c.  
F.o.b. Chicago, base, per lb.....2.30c.

## Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb.....2.10c.  
Soft steel bars f.o.b. Chicago, base, per lb.....2.20c.  
Reinforcing steel bars f.o.b. P'gh mills, base, per lb.....2.10c.  
Rail steel bars, f.o.b. Chicago district mills, base, per lb.....2.10c.  
Common iron bars, f.o.b. Chicago, base, per lb.....2.10c.  
Refined iron bars, f.o.b. P'gh mills, base, per lb.....3c. to 3.10c.  
Common iron bars, eastern Pa. mill, base, per lb.....2.10c.

## Hot-Rolled Flats

Hoops, base, per lb., Pittsburgh.....2.40c. to 2.50c.  
Bands, base, per lb., Pittsburgh.....2.40c. to 2.50c.  
Strips, Pittsburgh.....2.40c. to 2.50c.  
Strips, Chicago.....2.55c. to 2.60c.

## Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb.  
2.70c. to 2.80c.  
Screw stock and shafting, f.o.b. Chicago, base, per lb.....2.80c.  
Screw stock, base, per lb., Cleveland.....2.75c. to 2.85c.  
Shafting, ground, f.o.b. mill, base, per lb.....3.20c.  
Strips, f.o.b. P'gh mills, base, per lb.....4c. to 4.15c.  
Strips, f.o.b. Cleveland mills, base, per lb.....4c. to 4.15c.  
Strips, f.o.b. Chicago mills, base, per lb.....4.45c.  
Strips, f.o.b. Worcester mills, base, per lb.....4.30c.

## Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg.....\$2.85 to \$2.95  
Galvanized nails, 1-in. and longer, base plus.... 2.25  
Galvanized nails, shorter than 1-in., base plus.... 2.50  
Bright plain wire, base, No. 9 gage, per 100 lb.... 2.60 to 2.70  
Annealed fence wire, base, per 100 lb.....2.75 to 2.85  
Galvanized wire, No. 9, base, per 100 lb.....3.20 to 3.30  
Galvanized barbed, base, per 100 lb.....3.55 to 3.65  
Galvanized staples, base, per keg.....3.55 to 3.65  
Painted barbed wire, base, per 100 lb.....3.30 to 3.40  
Polished staples, base, per keg.....3.30 to 3.40  
Cement coated nails, base, per count keg.....2.15 to 2.25  
•Bale ties, carloads to jobbers...75, 15 and 5 per cent off list  
•Bale ties, carloads to retailers...75, 10 and 6 per cent off list  
Woven wire fence, base, per net ton to retailers.  
\$67.00 to \$69.00

Chicago district mill prices are \$2 per ton above the foregoing and Chicago delivered prices are \$3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mills \$3 a ton higher on production of that plant, and Duluth, Minn., mills \$2 a ton higher; Anderson, Ind., \$1 higher.

\*F.o.b. Cleveland.

## Sheets

Blue Annealed  
(base) per lb.

No. 9 and 10, f.o.b. Pittsburgh dist. mill.....2.70c.  
No. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills...2.80c.

## Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill...3.40c. to 3.50c.  
No. 28 (base) per lb., f.o.b. Chicago dist. mill...3.70c. to 3.80c.

## Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill.....4.60c.  
No. 28 (base) per lb., f.o.b. Chicago dist. mill...4.85c. to 4.95c.

## Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh dist. mill...3.40c. to 3.50c.  
No. 28 (base) per lb., f.o.b. Chicago dist. mill...3.70c.

## Automobile Body Sheets

No. 22 (base) per lb., f.o.b. mill.....4.40c. to 4.50c.

## Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill.....4.90c.

## Tine Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills.....\$5.50  
Standard cokes, per base box f.o.b. Chicago district mills 5.60  
Standard cokes, per base box f.o.b. Elwood, Ind.....5.60

## Terne Plate

(F.o.b. Morgantown or Pittsburgh)  
(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb	20-lb. coating I. C.....\$15.50
base.....\$11.20	25-lb. coating I. C.....17.00
8-lb. coating I. C.....11.50	30-lb. coating I. C.....18.35
15-lb. coating I. C.....14.35	40-lb. coating I. C.....20.35

## Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb..\$2.60  
Large, f.o.b. Chicago, base, per 100 lb.....2.75  
Small, f.o.b. Pittsburgh.....70, 10, 5 per cent off list  
Small, Cleveland.....70 and 10 to 70, 10 and 10 per cent off list  
Small, Chicago.....70 to 70 and 10 per cent off list

## Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton.....\$43.00  
Rails, light, billet, base, per lb.....1.80c. to 1.90c.  
Rails, light rail steel, base, per lb.....1.65c. to 1.75c.  
Spikes, 1/2 in. and larger, base, per 100 lb.....\$2.90 to \$3.20  
Spikes, 1/2 in. and smaller, base, per 100 lb.....3.10 to 3.50  
Spikes, boat and barge, base, per 100 lb.....3.25  
Track bolts, all sizes, base, per 100 lb.....3.90 to 4.25  
Tie plates, per 100 lb.....2.35 to 2.50  
Angle bars, base, per 100 lb.....2.75

## Welded Pipe

(F.o.b. Pittsburgh district mills)

### Butt Weld

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
1/2	45	19 1/2	1/4 to 3/8	+11	+39
3/4	51	25 1/2	3/8	22	2
1	56	42 1/2	1/2	28	11
1 1/4	60	48 1/2	1 to 1 1/2	30	13
1 1/2 to 3	62	50 1/2			

### Lap Weld

2	55	43 1/2	2	23	7
2 1/2 to 6	59	47 1/2	2 1/2	26	11
7 and 8	56	43 1/2	3 to 6	28	13
9 and 10	54	41 1/2	7 to 12	26	11
11 and 12	53	40 1/2			

### Butt Weld, extra strong, plain ends

1/2	41	24 1/2	2 to 3	61	50 1/2
3/4 to 1	47	30 1/2	1/4 to 3/8	+11	+54
1 1/4	53	42 1/2	3/8	21	7
1 1/2	58	47 1/2	1/2	28	12
1 to 1 1/2	60	49 1/2	1 to 1 1/2	30	14

### Lap Weld, extra strong, plain ends

2	53	42 1/2	2	23	9
2 1/2 to 4	57	46 1/2	2 1/2 to 4	29	15
4 1/2 to 6	56	45 1/2	4 1/2 to 6	28	14
7 to 8	52	39 1/2	7 to 8	21	7
9 and 10	45	32 1/2	9 to 12	16	2
11 and 12	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1 1/2 points, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and 2 1/2 per cent beyond the above discount.

Note—The above discounts on steel pipe also apply at Lorain and Youngstown, Ohio, and Wheeling, W. Va. Chicago district mills have a base 2 points less. Chicago delivered base 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

## Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel	Charcoal Iron
2 to 2 1/4 in.....27	1 1/2 in.....+18
2 1/2 to 2 3/4 in.....37	1 3/4 to 1 1/2 in.....+8
3 in.....40	2 to 2 1/4 in.....—2
3 1/4 to 3 3/4 in.....42 1/2	2 1/2 to 3 in.....—7
4 to 13 in.....46	3 1/4 to 4 1/2 in.....—9

Beyond the above discount, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

## Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.....60	3 in.....45
1 1/4 and 1 1/2 in.....52	3 1/4 to 3 1/2 in.....47
1 3/4 in.....36	4 in.....50
2 and 2 1/4 in.....31	4 1/2, 5 and 6 in.....45
2 1/2 and 2 3/4 in.....39	

## Hot-Rolled

2 and 2 1/4 in.....34	3 1/4 and 3 1/2 in.....50
2 1/2 and 2 3/4 in.....42	4 in.....53
3 in.....48	4 1/2, 5 and 6 in.....48

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

Carbon under 0.30 base.....85 to 87 per cent off list  
Carbon 0.30 to 0.40 base.....83 to 85 per cent off list  
Plus usual differentials and extra for cutting. Warehouse discounts range higher.

## Seamless Locomotive and Superheater Tubes

Cents per Ft.	Cents per Ft.
2-in. O.D. 12 gage....14 1/4	2 1/4-in. O.D. 10 gage...18
2-in. O.D. 11 gage....15	3-in. O.D. 7 gage....33
2-in. O.D. 10 gage....16	1 1/2-in. O.D. 9 gage....15
2 1/4-in. O.D. 12 gage...16	5 1/2-in. O.D. 9 gage...50
2 1/2-in. O.D. 11 gage...17	5 1/2-in. O.D. 9 gage...52



# Prices of Iron and Steel Products and Raw Materials

## Ores

*Lake Superior Ores, Delivered Lower Lake Ports*

Old range Bessemer, 55 per cent iron.....	\$5.65
Old range non-Bessemer, 51½ per cent iron.....	4.90
Mesabi Bessemer, 55 per cent iron.....	5.40
Mesabi non-Bessemer, 51½ per cent iron.....	4.75

*Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore*

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian.....	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron.....	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal.....	42c.
Manganese ore, ordinary, 48 per cent manganese from the Caucasus.....	40c.
Manganese ore, Brazilian or Indian, nominal.....	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates.....	\$9.50 to \$10.50
Chrome ore, Indian basic, 48 per cent Cr <sub>2</sub> O <sub>3</sub> , crude, per ton, c.i.f., Atlantic seaboard...	22.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS <sub>3</sub> , New York.....	80c.

## Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt.....	\$3.25 to \$3.50
Foundry coke, f.o.b. Connellsville prompt.....	4.25 to 5.00
Mine run steam coal, f.o.b. W. Pa. mines.....	1.50 to 2.00
Mine run coking coal, f.o.b. W. Pa. mines.....	1.50 to 1.75
Mine run gas coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.25
Gas slack, f.o.b. W. Pa. mines.....	1.30 to 1.40

## Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	115.00
Ferrosilicon, 50 per cent, delivered.....	\$82.50 to 85.00
Ferrosilicon, 75 per cent.....	145.00 to 147.50
Ferrotungsten, per lb. contained metal.....	90c. to 95c.
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered.....	11.50c.
Ferrovandium, per lb. contained vanadium.....	\$3.50 to \$4.00
Ferrocobaltitanium, 15 to 18 per cent, per net ton.....	200.00

## Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$33.00
Spiegeleisen, domestic, 16 to 19 per cent.....	32.00
Ferrosilicon, Bessemer, 10 per cent, \$39.50; 11 per cent, \$42; 12 per cent, \$44.50; electric furnace ferrosilicon, 10 to 11 per cent, \$38; furnace with an advance of \$1 per unit for material above 10 per cent.....	
Silvery iron, 5 per cent, \$27.00; 6 per cent, \$28.00; 7 per cent, \$29.00; 8 per cent, \$30.50; 9 per cent, \$32.50; 10 per cent, \$34.50; 11 per cent, \$37.00; 12 per cent, \$39.50.....	

## Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton, f.o.b. Illinois and Kentucky mines.....	\$20.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines.....	21.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton.....	18.00
Per 1000 f.o.b. works:	
Fire Clay	
Pennsylvania.....	\$43.00 to \$46.00
Maryland.....	48.00 to 50.00
Ohio.....	43.00 to 46.00
Kentucky.....	43.00 to 45.00
Illinois.....	43.00 to 45.00
Missouri.....	45.00 to 48.00
Ground fire clay, per ton.....	6.50 to 7.50
Silica Brick:	
Pennsylvania.....	40.00
Chicago.....	49.00
Birmingham.....	54.00
Silica clay, per ton.....	8.00 to 9.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	48.00

## Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland and Chicago)

Machine bolts, small rolled threads.....	60 and 10 per cent off list
Machine bolts, all sizes, cut threads.....	50, 10 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads.....	50, 10 and 10 per cent off list
Carriage bolts, cut threads, all sizes.....	50 and 10 per cent off list
Eagle carriage bolts.....	45 and 10 per cent off list
Lag bolts.....	60, 10 and 10 per cent off list
Flow bolts, Nos. 1, 2 and 3 heads.....	50 and 10 per cent off list
Other style heads.....	20 per cent extra

## Machine bolts, c.p.c. and t. nuts, ½ x 4 in.

45, 10 and 5 per cent off list	
Larger and longer sizes.....	45, 10 and 5 per cent off list
Hot-pressed nuts, blank or tapped, square.....	4c. off list
Hot-pressed nuts, blank or tapped, hexagons.....	4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped.....	4.10c. off list
Bolt ends with hot pressed nuts.....	50, 10 and 10 per cent off list
Bolt ends with cold pressed nuts.....	45, 10 and 5 per cent off list
Washers.....	6c. to 5.50c. off list
*F.o.b. Chicago and Pittsburgh.	

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits)

Semi-finished hex. nuts:

½ in. and smaller, U. S. S.....	80, 10 and 5 per cent off list
¾ in. and larger, U. S. S.....	75, 10 and 5 per cent off list
Small sizes, S. A. E.....	80, 10, 10 and 5 per cent off list
S. A. E., ½ in. and larger.....	75, 10, 10 and 5 per cent off list
Stove bolts in packages.....	80 and 5 per cent off list
Stove bolts in bulk.....	80 and 5 and 2½ per cent off list
Tire bolts.....	50, 10 and 5 per cent off list

## Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)

(To jobbers and consumers in large quantities)

Per 100 Net		Per 100 Net	
S. A. E.	U. S. S.	S. A. E.	U. S. S.
½-in. ....	\$0.44	¾-in. ....	\$2.35
¾-in. ....	.515	1-in. ....	3.60
1-in. ....	.63	1½-in. ....	5.50
1½-in. ....	.79	2-in. ....	8.90
2-in. ....	1.01	2½-in. ....	13.10
2½-in. ....	1.38	3-in. ....	18.35
3-in. ....	1.70	3½-in. ....	21.00

Larger sizes—Prices on application.

## Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws.....	80, 10 and 5 per cent off list
Milled standard set screws, case hardened.....	80 and 10 per cent off list
Milled headless set screws, cut thread.....	80 and 10 per cent off list
Upset hex. head cap screws, U. S. S. thread.....	8, 10, 10 and 5 per cent off list
Upset hex. cap screws, S. A. E. thread.....	8, 10, 10 and 5 per cent off list
Upset set screws.....	80, 10 and 10 per cent off list
Milled studs.....	75 per cent off list

## Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$37.00
Forging billets, ordinary carbon.....	42.50 to 45.00
Sheet bars.....	38.00
Slabs.....	37.00
*Wire rods, common soft, base, No. 5 to ½-in. 48.00 to 50.00	
Wire rods, common soft, coarser than ½-in. \$2.50 over base	
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp, grooved, per lb.....	2.10c.
Skelp, sheared, per lb.....	2.10c.
Skelp, universal, per lb.....	2.10c.

\*Chicago mill base is \$50 to \$52. Cleveland mill base, \$48 to \$50.

## Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E.	Series	Bars
Numbers		100 lb.
2100*	(½% Nickel, 10 to 20 per cent Carbon).....	\$3.00 to \$3.25
2300	(2½% Nickel).....	4.75
2500	(5% Nickel).....	6.25 to 6.50
3100	(Nickel Chromium).....	3.65
3200	(Nickel Chromium).....	5.50
3300	(Nickel Chromium).....	7.50 to 7.75
3400	(Nickel Chromium).....	6.50 to 6.75
5100	(Chromium Steel).....	3.50
5200*	(Chromium Steel).....	7.50 to 8.00
6100	(Chromium Vanadium bars).....	4.25
6100	(Chromium Vanadium spring steel).....	4.25
9250	(Silicon Manganese spring steel).....	3.50
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium).....		4c. to 4.25c.
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....		4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum).....		4.25
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....		3.75
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum).....		4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

\*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

## FEBRUARY STRUCTURAL SALES

### Slight Gain Over January But Much Below a Year Ago

WASHINGTON, March 17.—Sales of fabricated structural steel reported to the Bureau of the Census for February as 59 per cent of capacity, based on total bookings of 142,718 tons reported by fabricators with a capacity of 242,170 tons per month, as against January bookings of 57 per cent of capacity. Shipments of fabricated structural steel in February represented 64 per cent of the capacity of firms reporting this item, as against 60 per cent in January and 60 per cent a year ago.

### Generating Stations in New York Provide Majority of Tonnage Pending—Awards Increase

Outstanding inquiries reported in structural steel included 27,000 tons for public utility projects in New York and Brooklyn. The volume of new pending business totaled about 37,000 tons, or almost three times that of a week ago. Bids will be opened May 8 by the City of New York on the general contract for the Narrows tunnel, involving 98,000 tons of cast iron segments and a small tonnage of structural steel and reinforcing bars. Awards also showed an increase, bookings reported amounting to about 23,000 tons, against 18,000 last week. Among the largest purchases were 4000 tons for a high school at Jamaica, L. I., and an office building, 3500 tons, at Houston, Tex. Awards include:

Sears, Roebuck & Co., Philadelphia, shipping room, 300 tons, to Belmont Iron Works.  
Trade School, Philadelphia, 450 tons, to McClintic-Marshall Co.  
Pennsylvania Railroad, bridges, 350 tons, to McClintic-Marshall Co.  
Stone & Webster, Boston, power house, 250 tons, to Belmont Iron Works.  
National Board of Fire Underwriters, building at John and Gold Streets, New York, 2200 tons, to Taylor-Fichter Steel Construction Co.  
Garage on West 108th Street, New York, 440 tons, to Easton Structural Steel Co.  
Apartment house, Fifty-sixth Street and Seventh Avenue, New York, 800 tons, to Easton Structural Steel Co.  
Botany Worsted Mills, Paterson, N. J., factory, 350 tons, to James E. Brooks Co.  
Church of the Sacred Heart, New York, school, 350 tons, to Post & McCord.  
Jamaica high school, Jamaica, L. I., 4000 tons, to American Bridge Co.  
Girls' Catholic high school, New York, 1200 tons, to unnamed fabricator.  
Masonic Temple and office building, Concord, N. H., 260 tons, to New England Structural Co.  
Springvale, Me., die house, 230 tons, to McClintic-Marshall Co.  
Ralston Steel Car Co., Columbus, Ohio, 150 tons to Massillon Bridge Co.  
Mrs. Niels Esperson, Houston, Tex., office building, 3500 tons, to American Bridge Co.  
Hotel, Fourteenth Street and Baltimore Avenue, Kansas City, Mo., 900 tons, to Havens Structural Steel Co.  
Bridge over Platte River, La Platte, Neb., 450 tons, to Standard Bridge Co., Omaha.  
Buffalo, two marine towers, James Stewart & Co., general contractors, 450 tons, to McClintic-Marshall Co.  
Atchison, Topeka & Santa Fe, signal towers, 200 tons, to Kansas City Structural Steel Co.  
Theater, Seventy-sixth Street and Cottage Grove Avenue, Chicago, 290 tons, to A. Bolters Sons Co.  
Senior high school, addition, Fond du Lac, Wis., 119 tons, to Vulcan Mfg. Co.  
Commonwealth Steel Co., St. Louis, steel for No. 4 furnace, Granite City, Ill., 103 tons, to unnamed fabricator.  
City of Los Angeles, tank work, 245 tons, and pipe line, 400 tons, to Lacy Mfg. Co., also 230 tons for pipe line, to Baker Iron Works.  
Pacific Fruit Express Co., Roseville, Cal., shops, 470 tons, to unnamed Chicago fabricator.  
Gordon Valley water project, Vallejo, Cal., 3000 tons, to Western Pipe & Steel Co.  
Club house, Golden Gate Park, San Francisco, 150 tons, Brode Iron Works low bidder.

Geisel garage and Doctors' Professional Building, Springfield, Mass., 120 tons, to Palmer Steel Co.  
Woolworth Building, Springfield, Mass., 100 tons, to G. Haarman & Co.  
Bridge at Williamsport, Pa., 400 tons, to Phoenix Bridge Co.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

Seaboard Air Line, bridges, 700 tons.  
Delaware, Lackawanna & Western Railroad, bridges, 800 tons.  
Interborough Rapid Transit Co., New York, repair work, 200 tons.  
Standard Oil Co. of New Jersey, New York, tanks, 2200 tons.  
Florida East Coast, bridges, 600 tons.  
Pennsylvania Railroad, bridges, 200 tons.  
Brooklyn Edison Co., Brooklyn, N. Y., generating station, 10,000 tons, bids in.  
New York Edison Co., New York, generating station, East Fourteenth Street, 17,000 tons, bids in.  
Rumford, Me., hospital, 100 tons.  
Newton, Mass., high school, refigured, 325 tons.  
Columbus Electric & Power Co., Columbus, Ga., dam gates, 450 tons.  
Rumford, Me., storehouse, 200 tons.  
Providence, R. I., store and office building, 180 tons.  
Union Gas & Electric Co., Cincinnati, 150 tons.  
Allen Hotel, Dallas, Tex., 1200 tons.  
Office building, 1309 Walnut Street, Philadelphia, about 2000 tons instead of 500 tons, as reported last week.  
Chesapeake Canal work, 1000 tons, bids opening March 20.

## RAILROAD EQUIPMENT BUYING

### Car Purchasing and Inquiries Improved but Locomotive Orders Are Less Than in Previous Week

While purchases of cars covered slightly more than 650, new inquiries appeared for close to 3500. Of this the Missouri, Kansas & Texas provided a large part with inquiries for box, gondola and refrigerator cars totaling 1800. A fair volume of locomotive purchasing was reported although less than in the previous week. The largest award was that of the Burlington which placed 13 Mountain type engines. The New York Central, which appeared in the market with an inquiry for 500 gondola cars for the Big Four, closed on 5 locomotives for the Indiana Harbor Belt Line.

The Atlantic Coast Line is in the market for 500 box cars and 200 phosphate cars.

The Grand Trunk (Canadian National Railways) has ordered 25 caboose underframes from the Pressed Steel Car Co.

The Delaware, Lackawanna & Western is in the market for 300 refrigerator cars.

The Madeira Hill Coal Mining Co. has ordered 125 mine cars from the American Car & Foundry Co.

The Replier Coal Co. has ordered 125 mine cars from the American Car & Foundry Co.

The Missouri, Kansas & Texas is inquiring for 1000 50-ton box cars, 300 50-ton gondola cars and 500 30-ton refrigerator cars.

The Southern Pacific is inquiring for 10 coaches, 5 baggage, 6 horse, 6 baggage and mail, 5 passenger and baggage and 1 dynamometer car.

The Pennsylvania Salt Co. has placed 5 tank cars with the General American Tank Car Corporation.

The New York Central has placed 500 gondola cars for the Big Four with the American Car & Foundry Co. and is inquiring for 500 refrigerator and 100 air dump cars.

The Rock Island is inquiring for 100 gondola car bodies. Swift & Co., which was erroneously reported as having purchased 300 refrigerator cars, has decided to build the equipment in its own shops, buying the underframes.

The New York Central has placed 5 8-wheel switching locomotives for the Indiana Harbor Belt with the Lima Locomotive Co. and 3 Pacific type engines for the Rutland with the American Locomotive Co.

The Burlington has placed 13 Mountain type engines with the Baldwin Locomotive Works.

The Nevada Copper Belt has ordered 1 locomotive from the American Locomotive Co.

The Temiskaming & Northern Ontario has ordered 3 engines from the Canadian Locomotive Co.



## NON-FERROUS METALS

### The Week's Prices

Cents per Pound for Early Delivery									
March	Copper, New York		Straits Tin (Spot)		Lead		Zinc		
	Lake	Electrolytic*	New York	New York	New York	St. Louis	New York	St. Louis	St. Louis
11.....	14.62½	14.25	53.30	9.00	8.72½	7.62½	7.27½		
12.....	14.62½	14.25	54.00	9.00	8.72½	7.75	7.40		
13.....	14.62½	14.25	54.37½	9.00	8.72½	7.80	7.45		
14.....	14.62½	14.25		9.00	8.72½	7.80	7.45		
16.....	14.62½	14.25	53.37½	9.00	8.72½	7.77½	7.42½		
17.....	14.62½	14.25	53.00	9.00	8.72½	7.67½	7.32½		

\*Refinery quotation; delivered price ¼c. higher.

### New York

NEW YORK, March 17.

Inactivity characterizes all markets. With practically no change in quotations there has been almost no buying of copper. Sales of tin have been larger than those of any other metal, with prices varying but little. The lead market is sluggish at unchanged prices. Prime Western zinc has again fluctuated quite widely, with very little interest from consumers.

**Copper.**—The past week in electrolytic copper has been an extremely quiet one. With consumers fairly well covered and disinclined to make purchases and with producers loath to lower prices, quotations have been practically stationary at 14.50c., delivered. Yesterday and today there have been intimations that the metal could be obtained ¼c. lower, or at 14.37½c., delivered, but no transactions are reported at this level. There has been some domestic business during the past week but it has been negligible, and the same is true of the export market. Variations in quotations in London have also had their effect as in the recent past. Lake copper is quoted at 14.62½c., delivered, largely nominal.

**Tin.**—Only a fair volume of business in Straits tin is reported, the total for the week ended March 13 having been about 1000 tons. Dealers were the principal participants, with consumers less active than in the past. On March 12 there were fairly good sales of Chinese tin at around 50c. Yesterday the market was exceedingly weak, total sales amounting to around 200 tons, all futures, with business done all the way from 53.75c. at the opening down to 53c. at the close. This was interpreted as discounting a decline in London today, which turned out to be true, quotations there being £241 5s. for spot standard, £245 for future standard and £247 5s. for spot Straits, all about \$1 per ton less than a week ago. The Singapore price yesterday was £241. In a very moderately active market today, spot Straits tin was quoted at 53c. The fact that consumers are buying but little on a declining market is pointed to as striking; some interpret it as indicating that they covered their needs at higher prices. It now develops that two weeks ago total sales were much larger than estimated at that time, running to at least 1800 to 2000 tons. Arrivals thus far this month have been 2775 tons, with 6910 tons reported afloat.

**Lead.**—Current demand is light and confined largely to small lots, but specifications on contracts are heavy. The American Smelting & Refining Co. and the independent producers are all doing business at 9c., New York. Transactions at St. Louis range from 8.70c. to 8.75c.

**Zinc.**—The course of this market has been erratic, due largely to variations in London. Speculative activity on both sides has been a factor in the absence of domestic consuming interests. Prime Western zinc, after advancing to 7.45c., St. Louis, receded sharply today, due to a decline in London, with quotations ranging from 7.30c. to 7.35c., St. Louis, or 7.65c. to 7.70c., New York. The export market is inactive.

**Nickel.**—Shot and ingot nickel in wholesale lots are quoted at 31c. to 32c. per lb., with electrolytic nickel available at 38c.

**Antimony.**—The market is quieter and slightly easier, with spot Chinese metal quoted at 15.75c., New York, duty paid. March-April shipments from China are considerably lower at 12.50c. to 12.75c.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb., delivered.

**Old Metals.**—The market is quiet and prices are a little lower. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible .....	13.75
Copper, heavy and wire .....	13.00
Copper, light and bottoms .....	11.25
Heavy, machine composition .....	10.25
Brass, heavy .....	8.75
Brass, light .....	7.25
No. 1 red brass or composition turnings ..	9.75
No. 1 yellow rod brass turnings .....	9.50
Lead, heavy .....	7.50
Lead, tea .....	6.25
Zinc .....	4.75
Cast aluminum .....	19.00
Sheet aluminum .....	19.00

### Chicago

MARCH 17.—Copper, lead, zinc and antimony have declined, while tin after recent fluctuations is at the same level as a week ago. Spot buying is in fair volume but the absence of interest in futures contributes largely to the uncertainty of the market and the weakness of prices. Among the old metals, grades of copper, brass and tin have declined. We quote, in carload lots: Lake copper, 14.75c.; tin, 54.75c.; lead, 8.75c.; zinc, 7.50c.; in less than carload lots, antimony, 17.50c. On old metals we quote copper wire, crucible shapes and copper clips, 11.50c.; copper bottoms, 9.50c.; red brass, 8.25c.; yellow brass, 7.50c.; lead pipe, 7c.; zinc, 4.25c.; pewter, No. 1, 28c.; tin foil, 35c.; block tin, 40c.; all buying prices for less than carload lots.

### Iron, Steel and Allied Industries of California Is Name Chosen

The Iron, Steel and Allied Industries of California is the new name selected March 6 at Los Angeles, Cal., by the executive committee of the California iron and steel industry, which met for the first time since the Del Monte conference in January. Various matters of an executive nature were discussed, and an effort will be made to fix the exact dividing line of distribution of the different groups, and to establish ethical principles for the guidance of individual group members, so that duplication of efforts and the crossing of distribution channels may be avoided. Group meetings will be held by the different group chairmen for this purpose and they will report at another meeting of the executive committee to be held May 8 at the Ferry Building, San Francisco, under the auspices of the California Development Association.

### Railroad Wages in 1924

In spite of the fact that the total wage bill of the railroads decreased from \$3,004,083,599 in 1923 to \$2,866,905,348 in 1924, the average wage received by the employees was greater in 1924. The 1923 list showed 1,855,260 employees on the average, which works out at \$1,560 per head for the year. In 1924 there were 1,777,106 employees and the total wage bill works out at \$1,613 each. Thus the average pay envelope was 3.4 per cent greater in 1924 than in 1923, while the total wage bill was 4.6 per cent lower.

### Ludlum Steel Co. Directors Reelected

A statement by the Ludlum Steel Co. as of Jan. 31 shows total assets of \$4,485,434 and profit and loss surplus of \$1,871,621. Current assets compared with current liabilities as \$1,803,948 to \$132,047. At the recent stockholders' meeting, the retiring directors were reelected.

## PERSONAL

Harold G. Pickering, prominently identified as an attorney with the Pittsburgh plus case, has severed his connection with the legal firm of Pickering & Hughes,



HAROLD G. PICKERING

Superior, Wis., to become associated April 1 with the firm of Rushmore, Bissbee & Stern, New York. He will become a member of the latter firm as soon as he has complied with statutory requirements of six months' residence. Mr. Pickering was retained by the Western Association of Rolled Steel Consumers in August, 1920, to represent it in its action against the United States Steel Corporation in the basing point case. His selection as counsel for the Western association followed excellent services rendered in the initial stages of the case as representative of the Superior Commercial Club. In November, 1923,

he was retained by the 32 states known as the Associated States Opposing Pittsburgh Plus, and in that capacity was prominent in the final arguments which led to the decision of the Federal Trade Commission to order the abolition of the basing practice. Mr. Pickering was born at Lake Mills, Iowa, but became a resident of Superior before reaching school age. He attended the public and high schools there and graduated from the law school of the University of Wisconsin in 1912. He also studied for a year at the University of Michigan. After becoming a member of the bar in Wisconsin Mr. Pickering practiced for four and one-half years in Superior, following which he entered the air service of the United States Army, retiring as a lieutenant in the reserve corps. After his discharge from the army Mr. Pickering returned to Superior and formed a partnership with R. M. Rieser. In June, 1923, he formed a new partnership with Clarence J. Hughes. During the period from 1919 to the present time he was also associated with J. A. Murphy, attorney for the Great Northern Railway Co. The New York legal firm which Mr. Pickering joins has been in existence for over half a century, and among other institutions represents the Chase National Bank, New York.

Paul T. Farrell, for several years in the purchasing department, has been appointed assistant purchasing agent at Youngstown for the Youngstown Sheet & Tube Co., succeeding C. A. Ilgenfritz, who resigned to become general purchasing agent of the United Alloy Steel Corporation, Canton, Ohio. Mr. Ilgenfritz started in the steel business with the Sheet & Tube company, subsequently became purchasing agent of the Brier Hill Steel Co. and, when that company was absorbed by the former, engaged in business for himself as the Stroh-Ilgenfritz Co., dealing in raw materials for iron and steel manufacture. About a year ago Mr. Ilgenfritz reentered the service of the Sheet & Tube company, withdrawing from the Stroh-Ilgenfritz Co.

George W. Starr has resigned as purchasing agent of the United Alloy Steel Corporation, Canton, Ohio, and has been succeeded by C. A. Ilgenfritz, formerly purchasing agent of the Brier Hill Steel Co. and recently assistant purchasing agent of the Youngstown Sheet & Tube Co.

Dr. Richard Moldenke, Watchung, N. J., has become associated actively with the Detroit Aero Metals Co., having complete charge of all technical operations.

E. L. Essley, president E. L. Essley Machinery Co., Chicago, has returned to Chicago after a 60-day sojourn at Miami, Fla.

Frederick W. Ells and Walter J. Aitken, for many years associated with the Northwestern Mfg. Co., Milwaukee, manufacturer of electric motors and dynamos, have acquired controlling interest in the corporation from William Stark Smith and Mrs. Mary E. Harper. Mr. Smith relinquishes active management, but will remain as a director. Mr. Ells has been elected president and Mr. Aitken, secretary-treasurer. J. Fletcher Harper remains vice-president for the time being.

J. C. Hegeman, president Hegeman-Harris Co., construction company, New York, has gone to Youngstown to superintend building of the Stambaugh Memorial Auditorium, the gift to the city of Henry H. Stambaugh, steel maker, who was prominently identified with the Brier Hill Steel Co., serving as chairman of its board of directors for a number of years. Because of the monumental nature of the work, the construction will require approximately two years. In his will Mr. Stambaugh provided \$1,500,000 for this structure, which is being supervised by a board of trustees, headed by his brother, John Stambaugh.

E. F. Lunken, president Lunkenheimer Co., Cincinnati, has given 200 acres of choice land in the eastern part of Cincinnati to the Grisard Field Co. to be used as the center for Cincinnati aviation activities. The field will be used not only by the Grisard Field Co. but also by the reserve air squadrons of the United States Army.

Several changes in personnel of the Erie City Iron Works, Erie, Pa., were made at the recent annual meeting, Hays H. Clemens, treasurer Hays Mfg. Co., Erie, and a son-in-law of the late George D. Selden, founder and president for many years of the company, being elected president. He succeeds Edward C. Moore who, however, remains with the company as vice-president



L. V. REESE



T. E. DURBAN

and treasurer. L. V. Reese, general manager of the company, has been elected secretary and will hold that office in addition to his present duties. Mr. Reese, prior to becoming affiliated with the company about a year ago, was chief engineer of the U. S. Metals Refining Co. Thomas E. Durban, who formerly was general manager of the company and left it during the war period to give his time to the boiler code committee of the American Society of Mechanical Engineers, has returned to the company under the new régime. He will be director of sales and advisory engineer. Mr. Durban has a wide acquaintance in the power plant field.

James C. Ferris has resigned as vice-president in charge of sales and service of the Simmons Co., New York. He entered its employ as an apprentice in the buffing department of the original Simmons factory in Kenosha, Wis., about 26 years ago and rose to the post of general superintendent. With the expansion of the Simmons production and merchandising organization several years ago, he was appointed general superintendent of all operations, and two years ago he was made vice-president, with headquarters at the then newly established executive offices in New York.



Truman M. Dodson of Bethlehem, Pa., has been appointed vice-president in charge of operations, and Arthur Neale has been made general manager of mines for the Pittsburgh Coal Co., succeeding J. A. Donaldson and J. M. Armstrong. The retiring officers have been with the company since it was formed in 1899. Mr. Donaldson formerly was connected with the Monongahela Consolidated Coal Co. in charge of shipments on the Great Lakes, later becoming its president. Mr. Armstrong became general manager of the company in 1916. Mr. Dodson engaged in the coal business in 1900 with the Monroe Coal Co., after graduation from Lehigh University. At present he is president of the Weston, Dodson Co., Inc., Valley Smokeless Coal Co., Locust Mountain Coal Co., Charles M. Dodson Coal Co., Shipman Coal Co., Garrett County Coal & Mining Co., and the Upper Potomac Coal Operators' Association. Mr. Neale, who formerly was Mr. Armstrong's assistant, joined the Pittsburgh Coal Co. about 10 years ago, coming from the State mine inspection bureau, where he was an inspector.

M. S. McNay, for several years in the sales organization of the Bock Bearing Co., Toledo, Ohio, has been appointed sales manager. Mr. McNay is a graduate of Purdue University and served a short time in railroad engineering before going with the Hess-Bright Mfg. Co. as sales engineer in 1916. He transferred his activities from ball bearings to roller bearings in 1919, when he became associated in his present connection.

Charles Haydock, recently engineer of the Pennsylvania Railroad Water Companies, has become associated with the Lansdale Foundry Co., Lansdale, Pa., in the manufacture of grey iron and semi-steel castings, as vice-president and general manager.

C. F. Hutchins, associated with the Boston office of Waldo, Egbert & McClain, has resigned to accept a position with the New England Coal & Coke Co., with which he was associated before going with the pig iron house.

W. A. Shoudy has been appointed consulting engineer with special reference to combustion and furnace construction by the Bailey Meter Co., Cleveland. He will continue with his other consulting practice in steam power engineering from offices adjoining those of this company at 50 Church Street, New York.

W. H. Slingluff has been appointed to handle sales of wire rope fittings and other standard wire rope products in the middle western States for the American Cable Co., which recently opened a district sales office at 160 North LaSalle Street, Chicago. Mr. Slingluff has been actively identified with the wire rope field for more than 26 years.

William T. Clark has been appointed to the engineering staff of the Trico Fuse Mfg. Co., Milwaukee, to have charge of problems arising from unusual installations.

A. A. Boschert has been appointed sales engineer by the Harnischfeger Corporation, Milwaukee. He will work in both Washington and Oregon, with offices in the L. C. Smith Building, Seattle, Wash.

Farrand P. Hall has been appointed Cleveland district sales manager of the Carborundum Co., Niagara Falls, N. Y. He succeeds John MacArthur who has been Cleveland manager during the past five years. Mr. MacArthur has been assigned to special sales service work and will be located at the main office. The appointments are effective April 1. Mr. Hall joined the Carborundum Co.'s sales force in 1914, covering the territory in and about Montreal. Mr. MacArthur was appointed to the company's sales staff at Boston in 1909 and 1919 became sales manager at Cleveland.

Charles F. Abbott, executive director of the American Institute of Steel Construction, 350 Madison Avenue, New York, has been made chairman of the marketing and distributing council of the Advertising Club of New York, which will study problems of reducing waste in industry and distribution.

Paul C. Burton, mechanical designer and inventor of several devices patented for the National Automatic Tool Co., Richmond, Ind., and the Mechanical Engineering Co., Chicago, has joined the engineering staff of the Foote Brothers Gear & Machine Co. of Chicago.

E. W. Thompson, formerly associated with the J. K. Larkin Co., 253 Broadway, New York, resigned Feb. 7 to become secretary of the Culbert Pipe & Fittings Co., Jersey City, N. J.

Fred W. Wimmer, Homer F. Stocker and Myer W. Singer have been taken into the firm of the Hausman & Wimmer Co., dealer in iron and steel scrap, rails and metals, Pittsburgh. The three have been associated with the company for a long time.

H. R. Harmer, formerly secretary-treasurer of the A. R. Williams Machinery & Supply Co., Ltd., Montreal, Canada, machinery dealer, has been appointed a director and manager.

## OBITUARY

PAUL BIHAWK, assistant to the president, West Penn Steel Co., Brackenridge, Pa., died at his home in Freeport, Pa., March 15. He was born in Freeport 36 years ago, and had been identified with the West Penn Steel Co. for about 10 years, first as the president's clerk and later as his assistant, in which capacity he supervised the purchase of raw materials. Prior to going with the steel company, he had been employed for several years in the freight traffic department of the Pennsylvania Railroad.

PATRICK DONION, one of the oldest New England foundrymen and for approximately 50 years associated with the industry, the last part of his life as superintendent of the L. H. Goodnow Foundry Co., Fitchburg, Mass., died at his home in that city on March 10, in his seventieth year. Mr. Donion had retired about a year and a half ago. He was a native of Fitchburg and for many years was active in that city's politics and public welfare. He is survived by two sons, Leo and James Donion, who operate the Hogland Foundry Co., Gardner, Mass.

AUSTIN GODDARD GORHAM, an old-time Bostonian and a recognized metallurgist, died March 11 at Buxton, Me., where he had made his home for some time. He was in his seventy-seventh year.

RICHARD MUSE, until a few years ago superintendent of the Marshall Foundry Co., Pittsburgh, now out of existence, died March 13 at his home in that city. He was born in England 66 years ago, but for the past 40 years had resided in the Pittsburgh district. Mr. Muse was connected with the foundry 34 years and retired six years ago.

CLARENCE M. GARRIGUES, of the sales department of the Levering & Garrigues Co., steel fabricator, New York, died March 12 at his home in Plainfield, N. J., following a short illness. He was a graduate of Princeton University in 1920, was 27 years of age and the son of William A. Garrigues, president of the company.

NORMAN D. CARPENTER, for several years manager of sales in the Detroit territory for Carnegie Steel Co. and Illinois Steel Co., died at his residence in Los Angeles, Cal., March 10, aged 82. For many years Mr. Carpenter represented various steel companies at Grand Rapids, Mich., but gave up these agencies in 1887 when the Detroit office of Carnegie, Phipps & Co., later Carnegie Steel Co., Ltd., was opened. Upon the formation of the United States Steel Corporation in 1901, Mr. Carpenter represented both Carnegie and Illinois companies during the beginning of the automobile development in Detroit. He was widely known in Michigan and was one of the outstanding figures in the sales organization of the original Carnegie Steel Co. About seven years ago he retired and moved to Los Angeles, where he has since resided. He had been in excellent health and his death came after a brief illness. He is survived by his wife and sister. Interment will be at Grand Rapids, Mich.

FRANK SINGER, aged 58, president of the Syracuse Twist Drill Co., Syracuse, N. Y., was found dead at the plant on March 14. He had been connected with the company during the past 45 years, starting as a messenger boy and becoming president last year.

## EMPLOYEE REPRESENTATION

### Plans Found Successful in 16 of 20 Plants in Cleveland—Varied Results of Welfare Activities

CLEVELAND, March 16.—A report on personnel activities based on a survey of 111 Cleveland plants, largely in the metal working field, has been made by the committee on labor relations and the employment managers' group of the Cleveland Chamber of Commerce, A. C. Brown, president of the Brown Hoisting Machinery Co., being chairman of the former and George J. Leroux, of the National Malleable & Steel Castings Co. of the latter. The report shows that 16 companies have employee representation plans and all these report that the plan is working successfully. However, four other companies have discontinued employee representation. In its conclusion on this phase of the investigation the report states:

"This activity has been dropped by one of every five concerns adopting it. Both the number abandoned and the rareness of this activity suggests that its success depends in a large measure on the presence of certain favorable circumstances in the concern where it operates."

Tables of various personnel activities indicate the following according to the conclusions of the report:

"Employment offices and health and accident service are now quite generally regarded as indispensable, and once established, are seldom, if ever, discontinued. Overtime rates are of the same nature. Pension systems, while found in less than one concern in every ten reporting, show no discontinuance and similar stability. However, bands and orchestras, and less frequently, company stores, buying clubs and house organs have proved short-lived in so many instances that their actual value may be questioned."

"Cafeterias and insurance and sick benefits seem, in most cases, to be permanent institutions. Bowling and savings clubs appear, from the figures in the table, to be both popular and fairly permanent, whereas baseball teams have a much higher mortality rate."

### Wages of Sheet and Tin Mill Workers Unchanged

Tonnage rates paid workers in sheet and tin mills operating under the sliding scale wage agreement of the Amalgamated Association of Iron, Steel and Tin Workers remain unchanged for the March-April period as a result of the bi-monthly settlement conducted last week at Youngstown. The examination of sales sheets disclosed an average price of 3.40c. per lb. on Nos. 26, 27 and 28 gage black sheets shipped from Mid-Western mills during the 60 days ending with Feb. 28. This price was unchanged from the average two months before, and accordingly the tonnage rate, which rises or falls with the average selling price, continues for the ensuing two months without change.

### Report of Timken Roller Bearing Co.

Attention is called to the increased use of anti-friction bearings for general industrial equipment in the annual report of H. H. Timken, president Timken Roller Bearing Co. While the bulk of sales are to motor vehicle manufacturers, its sales of bearings for equipment outside of motor vehicles have practically doubled every year since 1920. This field includes railroad, mine and industrial cars, shop trucks, gravity and belt conveyors, elevators, line shaft hangers, machine tools, steel plant equipment, cranes and blowers. Regarding raw materials the report states:

"In our own electric steel plants we have after long experimentation and research selected electric furnace nickel molybdenum steel as superior to all others for bearings. We find that it is characteristically freer from segregations and non-metallic inclusions and has greater strength and ductility by 25 to 40 per cent than chrome nickel steel now generally used in manufacturing anti-friction bearings."

Mention is made of extensions in 1924, including the erection of a blooming mill and with the increased capacity it is stated that the company now has an annual capacity of 10,000 tons of electric steel available for sale in various finished forms. Expenditures for plant expansion and equipment last year were \$1,579,063.

In its financial statement the company reports operating profit during the year of \$7,113,691 and a net profit of \$5,805,686. After the payment of dividends \$1,054,819 was added to surplus.

### Harbison-Walker Refractories Co. Did Well Last Year

The annual report of the Harbison-Walker Refractories Co. for 1924 shows earnings after deducting \$1,119,319 for ordinary repairs and Federal taxes, of \$4,171,399, and after deductions of \$675,285 for depreciation and depletion, a net operating profit of \$3,496,113. The company transferred \$2,000,000 to its profit and loss account, this representing reserves against war-time contracts and by reason of the fact that through fire-proof construction of new plants and remodeling of old plants fire risks were reduced. This transfer enabled the company to carry \$3,811,688 to surplus, bringing the total to \$11,526,814. In his remarks to stockholders H. W. Croft, chairman, said:

"The favorable showing for the past year is due largely to the fact that several large contracts carried from 1923 well over into 1924, giving us a larger volume of business during that year than was indicated by normal requirements for the period; also to the persistent increase in the percentage of difficult shapes made of high-grade material."

"Immediately following the presidential election there was a decided upturn in orders, continuing until the first of the year at a rate insuring operations of 80 to 90 per cent during the first quarter. Orders received during January and February were equal to about 70 per cent of capacity and will probably continue on this basis through second quarter. Production during the same period was at 80 to 85 per cent of capacity, and with the orders on hand this rate will probably continue through the second quarter. There has been no change in prices since Jan. 1."

### Dividend Distribution of Steel Companies

Recent dividend distribution of steel and equipment companies includes what is in effect a 25 per cent stock dividend declared by directors of the American Steel Foundries and a declaration of \$10 a share extra dividend on 500,000 shares of no par stock by the American Locomotive Co. The American Car & Foundry Co., which is credited with holding a large block of American Locomotive Co. stock, has approved the directors' proposal to increase common shares from 300,000 of \$100 par value to 600,000 with no par value, the plan involving an exchange of one share of the old for a share of the new stock. The American Locomotive Co. also increased the annual rate from \$6 to \$8 a share.

President William H. Woodin of the American Car & Foundry Co. said that "the outlook for the country is very promising for 1925 and in fact for the next three years. The railroads are in the best condition in ten years. The only cloud on the horizon is the matter of tax reduction. We should have tax legislation reducing taxes as quickly as possible. Plants are operating comfortably full and the situation is satisfactory."

R. P. Lamont, president American Steel Foundries said that the company's operations are between 75 and 85 per cent.

The Colt Patent Firearms Mfg. Co., Hartford, Conn., has received a Polish contract for approximately \$3,000,000 Browning machine guns and small arms, the largest order for munitions received since the war. It will take the company several months to fill the order. The Fabrique Nationale, Liège, Belgium, is associated with the American company in the transaction.



# Machinery Markets and News of the Works

## LARGE RAILROAD LIST

### Clinchfield Road Inquires for About 50 Items of Shop Equipment

#### Inquiries for Machine Tools Are in Fair Volume But Buying Continues to Lag

Inquiries for machine tools outrun orders. Buying of shop equipment continues to lag, but the number of inquiries is encouraging. One of the largest before the trade is from the Clinchfield Railroad, Johnson City, Tenn., comprising about 50 items.

A frequent comment in machine tool circles is that business is "not as good as it is generally supposed to be," but figures of the National Machine Tool Builders' Association show that new orders for machine tools in February were 3 per cent more than in January and

50 per cent above November, since which time there has been a continued betterment. The index figures of the association, which are percentages of the monthly rate of new orders in the first quarter of 1920 taken as 100, are: November, 20.8; December, 25.4; January 29.9, and February, 30.7.

The Chicago Board of Education has finally placed orders for 24 engine lathes for a technical high school. Other business in the Chicago district shows slow expansion and orders are principally confined to individual tools. In Cincinnati the report is that the number of inquiries is encouraging, but that buying has fallen off. At Cleveland a fairly satisfactory volume of business is reported, including orders from the Ford Motor Co. for a new assembly plant in Minneapolis.

An export order of interest is for 15 or 20 special lathes from an automobile manufacturer in Italy, the lathes to be furnished by a Cincinnati company.

## New York

NEW YORK, March 17.

SOME fairly good export business has figured in the machine-tool trade the past week or two. An Italian automobile manufacturer has bought about 15 or 20 special lathes from a Cincinnati manufacturer, and the Andes Copper Mining Co., 25 Broadway, New York, has placed scattered orders, but did not buy all of the equipment for which it recently inquired. The Clinchfield Railroad Co., Johnson City, Tenn., has issued an inquiry for about 50 items of equipment for new blacksmith shop, woodworking shop and steel freight car shop. Cranes, heating furnaces, woodworking machines and other types of equipment are included in the list.

General machine-tool business is not up to expectations. A frequent comment is that "it is not as good as it is generally supposed to be." A few good orders for large tools have come to Eastern builders from the Middle West, but Eastern buying is rather slow. The Fisher Body Corporation, Detroit, has bought four 6-ft. radial drills. The Pennsylvania Car Co. has bought two 6-ft. radials for its shop at Beaumont, Tex. The Pittsburgh Piping & Equipment Co., Pittsburgh, bought a 10-ft. boring and turning mill. The E. L. Easley Machinery Co., Chicago, bought a 73-in. boring and turning mill. Other purchases include a 16-ft. pneumatic plate flanging clamp for the Panama Canal; a 1500-lb. steam hammer for the Missouri Pacific Railroad; a 96-in., 600-ton wheel press for the Nashville, Chattanooga & St. Louis Railroad.

The Landis Tool Co., Waynesboro, Pa., has sold to the Mesta Machine Co., Pittsburgh, a roll grinder which is one of the largest ever designed. It will have a 50-in. swing and will measure 24 ft. between centers, and will handle rolls weighing up to 27 tons.

Following are the items inquired for by the Clinchfield Railroad Co., W. A. Starritt, purchasing agent, Johnson City, Tenn.:

#### Smith Shop

One 4500-lb. steam hammer.  
One 500-lb. foot-operated hammer.  
One 1½-in. forging machine for bolts, etc.  
One spring forming machine.  
One electric flue welder.  
Three jib cranes with hoists to serve hammers.  
Ten single or five double forges equipped for down-draft exhaust and individual blowers.

One oil furnace about 6 x 8 ft. for 4500-lb. hammer.

Three oil furnaces for bolt forging machines.  
One case hardening furnace.

Motors for above equipment to be 220 volt d.c.  
*Freight Car Shop*

Two 20-ton electric traveling cranes, each with 3-ton auxiliary hoist; cranes 60-ft. span.

One 1200 to 1300-ft. motor-driven air compressor.

One single-end punch and shear, 45-in. throat, capacity to punch about 1¼-in. holes through 1¼-in. plates, and with attachment for punching angles.

One 500-lb., foot-operated, power-driven hammer with motor.

One riveter for coupler yokes, about 15-in. gap by 18-in. reach.

Five oil rivet heating furnaces.

One oil heating furnace about 8 x 12 ft.

Two forges equipped for down draft and individual blowers.

Motors for freight car shop to be a.c., 3 phase, 60 cycle, 220 or 440 volts.

#### Woodworking Shop

One small planer similar to No. 147 Fay & Egan.

One tenon machine similar to No. 531 Greenlee.

One mortising machine similar to No. 226 Greenlee.

One gaining machine similar to No. 502 Greenlee.

One double spindle shaper similar to No. 202 Fay & Egan.

One 6-in. four-side molding machine similar to No. 209 Fay & Egan.

One 4-in. rip and band saw similar to No. 190 Fay & Egan.

One iron frame drum and disk sander similar to No. 2 Fay & Egan.

#### Material Yard

One 15 or 20-ton self-propelling yard crane to run on standard gage track, with magnet and generator.

One heavy-duty locomotive tractor crane truck of 3000-lb. capacity.

One elevating tractor truck.

One shop tractor with trailer.

Charles E. Birge, 29 West Thirty-fourth Street, New York, architect, has awarded a general contract to Thompson & Binder, Inc., 103 Park Avenue, New York, for a five-story automobile service, repair and garage building, 100 x 150 ft., at Atlantic Avenue and Adelphi Street, Brooklyn, for the Detroit Motor Car Realty Co., 1891 Broadway, New York, to cost \$400,000 with equipment.

The Garofano Construction Co., Inc., First National Bank Building, New York, is in the market for a gasoline or steam-operated crane, about 1 yd. capacity, with 40 to 50 ft. boom, convertible to shovel.

The Toho Electric Power Co., Ltd., Nagoya, Japan, is disposing of a bond issue in the United States for \$15,000,000, the entire proceeds to be used for extensions in electric generating plants and the purchase of equipment, including

the completion of the steam-operated electric power station now in course of construction at Nagoya. The Guaranty Trust Co., 140 Broadway, New York, is fiscal agent for the company.

The Borden Farm Products Co., 110 Hudson Street, New York, has plans in preparation for a seven-story refrigerating and cold storage plant at 8-10 Joy Street, to cost \$200,000 with equipment.

Dennis J. Grullo, 746-A Union Street, Brooklyn, architect, will erect a two-story automobile service, repair and garage building, 98 x 100 ft., at 439-45 West Thirty-ninth Street, New York, to cost \$80,000.

The Modern Brass Novelty Co., 224 Centre Street, New York, has leased a floor in the building at 120-22 Wooster Street, for extensions.

The American Bank Note Co., 70 Broad Street, New York, manufacturer of paper goods, has awarded a general contract to the Caldwell-Wingate Co., 381 Fourth Avenue, for a two-story addition to its plant on the Hunts Point Road. Oscar P. Cadmus, 157 East Forty-fourth Street, is architect.

The Buenos Aires Pacific Railway, Buenos Aires, Argentina, will erect a grain elevator at the new port of Buenos Aires, to cost approximately \$1,500,000 with hoisting, conveying, loading and other machinery. Edward E. Feely, commercial attache, Bureau of Foreign and Domestic Commerce, Buenos Aires, has information regarding the project.

The Consolidated Gas Co., 130 East Fifteenth Street, New York, will construct a coal-handling plant for its Hunts Point generating station to cost in excess of \$150,000.

The J. & B. Auto Co., 12 Division Street, Amsterdam, N. Y., has plans for a two-story service, repair and garage building at 16 Division Street, 70 x 120 ft., to cost \$75,000, for which bids are being asked on general contract. Thomas McGibbon, 63 Arch Street, is architect.

The Board of Transportation, 49 Lafayette Street, New York, has awarded contract to Levering & Garrigues, 552 West Twenty-third Street, for its proposed railroad inspection shop, for subway cars, at Corona, N. Y., to cost more than \$100,000 with equipment.

The Tokio Electric Light Co., Tokio, Japan, has arranged an expansion program to include two automatic power substations at Tokio; completion of the steam-operated electric power station at Senju, and a hydroelectric power station on the Nippashi River. Later the company plans the construction of a hydroelectric power station on the Nagase River.

A plan is under way for the establishment of a number of trade schools in the State of Ceara (Fortaleza) Ceara, Brazil, and machine tools, machine shop equipment and other apparatus will be installed. Fred C. Eastin, Jr., vice-consul American Consulate, Pernambuco, Brazil, has information regarding the project, and suggests that American companies in position to furnish equipment address proposals to the President of the State in the Portuguese language.

The Manufacturers' & Inventors' Electric Co., 29 Gold Street, New York, has acquired the six-story building, 25 x 103 ft., at 228 West Broadway, and will occupy the larger portion of the structure for a new plant. Albert H. Smith is head.

Charles Miller & Co., North Bergen, N. J., meat packers, will build a power house in connection with a new packing plant on the Secaucus Road, the entire project to cost about \$130,000 including equipment. Himmelsbach & Schlich, 136 Liberty Street, New York, are architects.

The Acme Handle Co., 220 Orient Avenue, Jersey City, N. J., will soon take bids on revised plans for a two-story plant, 100 x 100 ft., to cost \$35,000. John Armstrong, 36 Gautier Avenue, is architect.

The Petroleum Terminal Co., Avenue A and First Street, Bayonne, N. J., will erect a storage and distributing plant, including pumping station, to cost about \$105,000 with equipment.

The Argus Mfg. Co., Inc., 150 Bloomfield Avenue, Bloomfield, N. J., manufacturer of automatic traffic signal devices, contemplates extensions and the installation of tools, dies, jigs, etc. Frank E. Madison is secretary.

The North Jersey Foundry Co., 136 Grand Street, Paterson, N. J., has awarded contract to C. Alberg, 168 Washington Avenue, Hawthorne, N. J., for remodeling a one-story building, 50 x 71 ft., at Singac, N. J. It will cost about \$25,000.

The Weehawken Electric Welding Co., Hoboken, N. J., has leased the building at 45 Jackson Avenue, totaling about 5000 sq. ft., for a new plant.

The Hopewell Township Board of Education, Hopewell, N. J., plans the installation of manual training equipment in two new schools to be erected at Hopewell and Penning-

ton, respectively, to cost about \$130,000 and \$100,000. J. Osborne Hunt, Hunt Building, Trenton, N. J., is architect.

A general agency for the purchase of all construction materials for use in Portuguese colonies has been established in Lisbon, Portugal.

The Latvian Government plans to build a railroad about 200 miles long, connecting the cities of Libau and Mitau. Requirements and specifications have not been fully determined, but it is estimated that the following will be required: 13,185 tons of rails; 3240 tons of fishplates, bolts, etc.; a bridge requiring about 500 tons of iron work; 50 to 60 switches.

## Philadelphia

PHILADELPHIA, March 16.

BIDS have been asked on a general contract by the Henry Disston & Sons Co., Tacony, Philadelphia, manufacturer of saws, files, etc., for its proposed additions, to cost \$75,000 with equipment. Bigelow, Kemp & Willard, Philadelphia, are architects.

The Electric Storage Battery Co., Nineteenth and Allegheny Streets, Philadelphia, has plans for a one-story addition, 80 x 245 ft., to cost approximately \$85,000. The William Steele & Sons Co., 218 North Broad Street, is architect and engineer.

The Atwater Kent Mfg. Co., 4937 Stenton Avenue, Philadelphia, manufacturer of radio and electrical apparatus, has taken title to property at Abbottsford Avenue and McMichael Street, totaling about 8 acres, for \$100,000 and will use it for extensions. Bids have recently been taken for a one-story and basement plant, 50 x 225 ft.

Reuben Beard, 2120 North Lambert Street, Philadelphia, architect, has completed plans for a two-story automobile service, repair and garage building, 55 x 97 ft., to cost \$65,000.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received the following inquiries: (43315) from Melquiades Gonzalez, Mercado, "Benito Juarez," San Pedro, Coahuila, Mexico, desiring to get in touch with American manufacturers of machinery for making tin spoons, etc.; (43310) from Ocansey's Stores, P. O. Box 217, Accra, Gold Coast, West Africa, wishing to get in contact with American manufacturers of folding portable chairs; (43321) from J. Molbach Thellefsen, Lille Graensengade 7, Oslo, Norway, desiring to get into communication with American manufacturers of street, tramway and railroad cars, iron and steel, ammunition, etc.; (43300) from the Bombay Match Works, 164 Samuel Street, Bombay, India, in the market for American match-making machinery, desires catalogs and particulars as to prices, etc.; (43303) from D. L. Bradford, 75 Queen Street, Pretoria, Transvaal, South Africa, wishing to get in touch with American manufacturers of bolts, nuts, rivets, electrical appliances, hardware, horse-shoes, lanterns, candle-molding machinery, nails, wheelbarrows, wire fencing and kindred products.

The John A. Roebling's Sons Co., Trenton, manufacturer of wire rope, cables, etc., has filed plans for a one-story addition, 96 x 158 ft., to cost about \$40,000.

H. M. Musser, 717 North Market Street, Lancaster, Pa., manufacturer of umbrella handles, etc., has plans for a two-story and basement factory for wood-turning and affiliated manufacture, 56 x 62 ft., to cost \$30,000 with equipment. J. B. Harman, 54 North Queen Street, is architect.

Fire, March 8, destroyed the two-story, 40 x 80 ft., plant of the Crescent Gas Stove Mfg. Co., Railroad Street, Lehigh-ton, Pa., with loss of \$30,000 including equipment. Rebuilding plans are under consideration.

The Splittorf-Bethlehem Electrical Co., Bethlehem, Pa., has been organized to take over and consolidate the Bethlehem Spark Plug Co., and the Splittorf Electrical Co., 392 High Street, Newark, N. J. The new organization will continue both works in service and plans expansion in the manufacture of radio equipment. F. H. Schwab is one of the heads of the consolidated company. Charles M. Schwab, chairman of the Bethlehem Steel Corporation, is understood to be interested in the organization.

The Board of Education, Allentown, Pa., plans the installation of manual training equipment in its two-story and basement junior high school estimated to cost \$465,000. Ruhe & Lange, 12 North Sixth Street, are architects.

Fire, March 11, destroyed a portion of the automobile body and wagon manufacturing plant of W. H. Campbell & Sons, Olyphant, Pa., with loss of \$60,000 including equipment. It is planned to rebuild.

The Board of Trustees, Hershey Industrial School, Hershey, Pa., has plans for the construction of a new unit to cost \$100,000 with equipment. C. Emlen Urban, Lancaster, Pa., is architect.



## The Crane Market

THE volume of inquiry for both electric overhead and locomotive cranes continues small in contrast to the usual activity that develops as spring approaches. Dullness in the building trades is believed to be responsible for part of the quiet in the locomotive crane field and the general quietness of business has doubtless affected the interest of manufacturers and others in overhead equipment. In the overhead field the Public Service Production Co., Newark, has revised its inquiry for a 6-ton and 8-ton hand power crane for Harrison, N. J., to one 10-ton hand power crane. The Virginian Railway, for which Gibbs & Hill, engineers, New York, are purchasing two cranes, is understood to be inquiring direct from Roanoke, Va., for a 5-ton electric traveling crane. The General Electric Co., Schenectady, N. Y., is asking for a 10-ton electric traveling crane for a Cleveland, Ohio, warehouse. One of the largest locomotive crane inquiries in some time comes from a large copper interest and calls for a 25-ton, a 40-ton, a 10-ton standard gage with alternate on crawl tread, and a 150-ton wrecking crane. The Foundation Co., 120 Liberty Street, New York, is interested in the purchase of a used locomotive crane for use at Troy, N. Y. The Clinchfield Railroad Co., Johnson City, Tenn., is in the market for two 30-ton electric cranes, three jib cranes and a 15 to 20-ton yard crane.

Among recent purchases are:

Southern Pacific Railroad, New York, two 25-ton locomotive cranes from the Industrial Works. One wrecking crane on this inquiry is still pending.

Florida East Coast Railroad, New York, a large wrecking crane from the Industrial Works.

Thomas E. Murray, New York, consulting engineer, two 200-ton overhead cranes for the New York Edison Co., from the Whiting Corporation.

Foundation Co., 120 Liberty Street, New York, for the Southern Railway, two 2-ton electric hoists from the Whiting Corporation and a 5-ton and 10-ton chain block from the Chisholm-Moore Mfg. Co.

Elliot Co., Jeannette, Pa., a 5-ton electric traveling crane from the Northern Engineering Works.

Atlantic Works, Boston, Mass., a 10-ton gasoline driven, crawl-tread locomotive crane from the Northwest Engineering Co.

Bentley, Morris & Co., Elizabeth, N. J., a 10-ton gasoline driven, crawl-tread locomotive crane from the Northwest Engineering Co.

J. J. Spurr & Son, Harrison, N. J., stone yard, a 12-ton electric traveling crane from Manning, Maxwell & Moore, Inc., Shaw Electric Crane Works.

Pittsburgh Steel Products Co., Allentown, Pa., two 20-ton, 96-ft. 7-in. span cranes; one 7-ton, 115-ft. 3-in. span; three 7½-ton, 62-ft. 2-in. span, and one 10-ton, 84-ft. 10-in. span crane from the Morgan Engineering Co.

Power Construction Engineering Co., Worcester, Mass., reported to have closed on a 35-ton, 26-ft. span power house crane for the hydroelectric plant of the Farmington River Power Co.

Foundation Co., 120 Liberty Street, New York, a 1½-cu. yd. bucket handling crane for installation at Troy, N. Y., from the Milwaukee Electric Crane & Mfg. Co.

The South Penn Collieries Co., Port Carbon, Pa., has plans under way for a new coal breaker in this section to replace the plant recently destroyed by fire. It will cost more than \$85,000 with machinery.

The Alloy Metal Wire Co., Moore, Pa., is in the market for an electric induction melting furnace complete, 500 lb. capacity. State make, with details as to equipment, such as transformers, control switches, panel board, etc.

The Hayes Equipment Co., 1615 South Michigan Avenue, Chicago, incorporated with \$300,000 capital stock, will manufacture spring suspensions for automobiles, trucks and railroad equipment. It is leasing the present location for offices and light assembly work. Castings are being made by outside foundries. It is in the market for coil springs, bolts, drop forgings and steel castings. James G. Hayes is president-treasurer and Thomas J. Tubbs, secretary.

The E. B. Leaf Co., Real Estate Trust Building, Philadelphia, is in the market for fine, clean cast iron borings.

The Trenton Metal Folding Chair Corporation, Trenton, N. J., has been incorporated to manufacture metal chairs and like steel products. It plans to secure a factory and in the near future will be in the market for equipment and material. G. W. Schultz is one of the principals.

The Vanadium Corporation of America, Bridgeville, Pa., is in the market for a 100,000 lb. Olsen tensile testing machine. It is also interested in a Nasel hammer capable of reducing 4 x 4-in. steel ingots to 1 x 1-in. bars; also complete laboratory heat treating equipment, including cyanide pots, quenching vats, high speed furnace, etc.

A. J. O'Neill, 1524 Chestnut Street, Philadelphia, is in the market for saddle tank locomotives, both narrow and standard gage, and also switching locomotives.

## Buffalo

BUFFALO, March 16.

THE Hollow Staybolt Iron Works, Rome, N. Y., will rebuild its plant recently destroyed by fire, to be one-story, 65 x 120 ft., estimated to cost \$100,000 with equipment. It is expected to begin work in May. M. Strawbridge is president.

The General Crushed Stone Co., Le Roy, N. Y., has acquired the plant of the Geneva Limestone Co., Oakes Corners, N. Y., and will operate as a branch. Extensions are planned, including additional equipment. It is completing the rebuilding of its crushing plant at Akron, N. Y.

The Plastergon Wall Board Co., 196 Philadelphia Avenue, Buffalo, has acquired property adjoining its former plant, destroyed by fire a few months ago, and will build new works, one and two stories, 120 x 481 ft., to cost \$65,000. Machinery to be installed will be electrically operated. W. G. Saville is president.

The Convertible Wagon Trailers, Inc., 216-16 Amherst

Street, Buffalo, manufacturer of roller type, rear dump bodies for automobile trucks, is disposing of a preferred stock issue of \$250,000, a portion of the proceeds to be used for expansion. William H. Cooke, Jr., is president.

The Marine Elevator Co., Chamber of Commerce Building, Buffalo, has begun the construction of a new elevator adjoining its present plant, to cost about \$1,000,000 with machinery. It will be equipped with hoisting, conveying, loading and other apparatus for a capacity of 2,000,000 cu.

The Sterling Furniture Co., 16 Nelson Avenue, Salamanca, N. Y., is asking bids on general contract for a four-story addition, 80 x 80 ft., for which plans have been drawn by A. W. E. Schoenberg, First National Bank Building, Olean, N. Y., architect. W. O. Frederickson is head.

Baldwin & Johnson, Westfield, N. Y., are in the market for a lathe, drill press and a cylinder reborer machine, for a new two-story and basement garage.

## New England

Boston, March 16.

CURRENT sales of machines are confined to a few used and new tools, mostly used, and almost without exception at a concession. A 16-in. shaper taken by a Massachusetts shop was the most important new tool sold the past week. Garages are buying used 14-in. lathes and occasionally a used drill. New inquiries have fallen to still smaller proportions, and old prospects are extremely difficult to sign up. It is believed the attitude of buyers is due to the fact that they are producing goods at a small margin of profit and therefore are not in position to lay out money on new equipment. The dullness of the metal-working market is in direct contrast with the wood-working. The demand for the latter equipment is active and prices are strong.

F. C. Hersee, 22 Parkman Street, Watertown, Mass., automobile tools, has abandoned plans to erect a one-story factory.

Bids closed last week on alterations and improvements to the technical high school, Newton, Mass. Haven & Hoyt and E. W. Deering, 200 Devonshire Street, Boston, have the plans.

Motors will be required for a two-story, 75 x 75 ft. spinning mill to be erected at West Medway, Mass., by the Stone Mill Co. Plans are private.

Contract has been awarded by the Jennison Heating Co., Putnam Street, Fitchburg, Mass., steam fittings, for a one and two-story plant and warehouse to cost, exclusive of

equipment, \$50,000. H. A. Foster, 15 Oliver Street, is the architect.

The Hartford Coke Co., Hartford, Conn., is going ahead with plans for the construction of a \$2,500,000 plant for the production of gas, by-product coke, coal tar and ammonium sulphate.

Lockwood, Greene & Co., Boston, engineers, are preparing plans for a \$1,000,000 plant for the Gold Dust Corporation, New York and Cincinnati, to be in operation January, 1926, for which miscellaneous equipment will be required. The main plant will be five stories and contain five acres of floor space.

Fire, March 9, destroyed a portion of the refining and storage plant of the Beacon Oil Co., Everett, Mass., with loss estimated at \$125,000 including equipment. It is proposed to rebuild.

Arthur Rosenstein, 220 Devonshire Street, Boston, architect, has plans for a one-story automobile service, repair and garage building, 125 x 300 ft., at 1246 Massachusetts Avenue, to cost \$160,000, for which bids are being received on a general contract.

The Locke Steel Chain Co., 1085 Connecticut Avenue, Bridgeport, Conn., has awarded a general contract to the Eastern Engineering & Construction Co., Liberty Building, for its one-story addition, 83 x 156 ft. C. W. Walker, Jr., Bridgeport, is architect.

The Durham Storage Co., 35 Olive Street, New Haven, Conn., will erect a three-story and basement cold storage and refrigerating plant, 33 x 50 ft., for which bids will be asked on general contract this month. It will cost about \$60,000. Westcott & Maples, Inc., 207 Orange Street, is architect and engineer.

Coal hoisting, conveying and other handling machinery, will be installed in connection with extensions at the coal yards of G. E. Willis & Son, Inc., Manchester, Mass. Work will begin in April.

The Board of Trustees, Community Hospital Association, Rumford, Me., plans the construction of a power house in connection with proposed institutional buildings estimated to cost \$300,000. Rogers & Dixon, 142 Berkeley Street, Boston, are architects.

The Factory Supply Co., 306 Pearl Street, Hartford, Conn., recently organized with capital stock of \$50,000, will engage in a general mill supply business. It will be in the market for mill supplies, such as drills and reamers, files, cutters, etc. B. G. Austin is president; Joseph Merritt, secretary, and R. J. Dunn, treasurer.

## Chicago

CHICAGO, March 16.

THERE continues to be slow expansion in machine-tool buying, although current trade is confined principally to orders for individual machines from scattered sources. The Chicago Board of Education, however, has finally closed against its inquiry for 24 engine lathes which has been pending for months. The Monarch Machine Tool Co., Sidney, Ohio, has an order for 12 14-in. lathes, and the Rockford Lathe & Drill Co., Rockford, Ill., an order for an equal number. All 24 will be installed in the Tilden Technical High School, Chicago. The National Lock Co., Rockford, Ill., has closed for a No. 1½ plain milling machine and a 16-in. shaper. The Southern Iowa Utilities Co., Centerville, Iowa, has bought a 16-in. used shaper and a 14-in. used lathe. The American Steel & Wire Co. has ordered a turret lathe for its Waukegan, Ill., plant. The Pullman Car & Mfg. Corporation, Pullman, Ill., is buying a few tools from time to time and the same is true of other leading industrial companies.

The Atchison, Topeka & Santa Fe has added four items to its pending list as follows: One motor-driven Niles, or equivalent, combination heavy pattern car wheel journal truing and axle lathe, one motor-driven 90-in. Putman, or equivalent, standard pattern driving wheel lathe, one pneumatic jib crane to operate on 80-lb. air pressure complete with hoist, and one motor-driven 6-ft. radial drill. The Chicago, Burlington & Quincy is inquiring for a motor-driven pedestal type dry grinder with 24 x 4-in. emery wheels, one motor-driven pedestal type dry grinder with 18 x 3-in. grinding wheels, and one motor-driven

200-lb. helve-type hammer. The Burlington, however, will not be ready to issue a list covering its main budget requirements for some time.

Contract has been awarded by the National Lock Co., 1930 Seventh Street, Rockford, Ill., to the Security Building Co., Rockford, for a seven-story and basement plant, 80 x 375 ft., estimated to cost \$300,000 with equipment. Weiss & Niestadt, 53 West Jackson Boulevard, Chicago, are architects.

The commanding officer, Rock Island Arsenal, Ill., is asking bids until March 24 for adjustable tap wrenches, screw plate sets, socket wrench sets, etc., under four specifications, O-AP 35613-A, O-AP, 35614-A, O-AP, 35615-A, and O-AP 35616-A; until March 26 for hand reamers, shell reamers, taper pin reamers, etc., under four specifications, O-AP 35619-A, O-AP 35620-A, O-AP 35621-A, and O-AP 35622-A.

The St. Paul Gas Light Co., Cedar and Sixth Streets, St. Paul, Minn., has plans for a three-story L-shaped storage and distributing plant, with automobile service and repair garage for company trucks and cars, estimated to cost \$400,000 with equipment. A portion of the structure will be used for offices. Toltz, King & Day, Inc., Builders' exchange, is architect.

The Common Council, McCook, Neb., has authorized a bond issue of \$200,000 for a municipal electric light and power plant.

The Victor X-Ray Co., 236 South Robey Street, Chicago, manufacturer of X-ray and precision equipment, is having plans drawn for an eight-story and basement factory, to cost approximately \$300,000 with machinery. S. N. Crowen, 10 South La Salle Street, is architect. C. F. Samms is president.

The K. & S. Mfg. Co., 1315 West Twenty-first Place, Chicago, manufacturer of steering equipment and parts, has plans for a one-story factory, 100 x 120 ft., at Cicero, Ill., to cost approximately \$95,000 with equipment. J. J. Novy, 2434 South Ridgeway Street, Chicago, is architect. Louis J. Kucki is president.

The Washburn High Line Co., Washburn, N. D., has acquired the electric light and power plant at Garrison, N. D., and plans extensions and the installation of additional equipment. J. W. Campbell is manager.

The St. Paul Foundry Co., 27 East Seventh Street, St. Paul, Minn., is considering rebuilding the portion of its plant recently destroyed by fire, with loss estimated at about \$200,000 including equipment.

The Peerless Chain Co., Front and Wallace Streets, Winona, Minn., will erect a new one-story and basement plant, 40 x 120 ft., adjoining the present works. Dennis & Knowles, Winona, are architects.

The Minnesota Masonic Home Association, Oneida Building, Minneapolis, Minn., plans the construction of a power house in connection with a mechanical laundry at its institution at Bloomington, Minn., estimated to cost \$75,000. Bertrand & Chamberlin, 616 Northwest Building, Minneapolis, are architects.

A general contract has been awarded by the Clinton Glass Works, 1000 West Twenty-first Street, Chicago, for a two-story reinforced concrete factory, to cost \$60,000. Machinery requirements will include grinding, polishing and beveling equipment.

The International Harvester Co., purchasing department, 606 South Michigan Avenue, Chicago, is inquiring for a used electric butt welder, capacity 9 x ¼ in. tires.

## Cleveland

CLEVELAND, March 16.

MACHINE-TOOL business is gradually improving and the volume of sales so far this month has been satisfactory. Orders are numerous, but largely confined to single machines. Business is well scattered among various industries. The Ford Motor Co. is buying equipment for its large assembling plant in Minneapolis, and closed for several machines for its tool room the past week. Orders for large machines include a 36-in. lathe with 28-ft. bed placed by the Youngstown Sheet & Tube Co. and an 8-ft. radial drill bought by the Marion Steam Shovel Co. The latter company is reported to have also purchased a number of used tools.

The Elyria Iron & Steel Co., Cleveland, is arranging for extensions to its local plant. Two additions will be made to the two factory buildings, 160 x 160 ft. and 70 x 100 ft., respectively. A three-story administration building, 40 x



100 ft., and a boiler house will also be erected. Ernest McGeorge, 3030 Euclid Avenue, is the consulting engineer.

The Ralston Steel Car Co., Columbus, Ohio, has placed a general contract with L. L. LeVegue Co., Columbus, for extensions, to include a one-story addition to its main building and a new wheel and axle building.

The Mack Iron Works, Sandusky, Ohio, is erecting a one-story addition, 56 x 120 ft.

The Hobart Brothers Co., Troy, Ohio, will erect a three-story factory and office building, 120 x 128 ft. for the manufacture of battery charging machines.

The Union Tank Car Co., Toledo, Ohio, subsidiary of the Standard Oil Co. of Ohio, East Ohio Gas Building, Cleveland, has awarded contract to the H. J. Spelker Co., Toledo, for a car repair and blacksmith shop and other buildings.

E. M. Freese & Co., Gallon, Ohio, manufacturers of brick and clay working machinery, are arranging for the erection of a pattern storage building. Plans for a one-story foundry, 100 x 120 ft., are being held in abeyance.

Manual training departments will be installed in schools in the following Ohio cities, for which bids are being taken: Gallon junior high school, E. W. Nichols, clerk of the board of education; junior and senior high school, New Washington, R. G. Bought, superintendent of the board of education; grade and high school, Port Washington, C. J. Caster, president of the board of education; grade and high school, Manchester, Ohio, E. T. Cochran, president of the board of education.

The Will-Burt Co., Orrville, Ohio, is in the market for a 4-ft. radial drill and a large disk grinder.

The Whittier Devices Co., Mansfield, Ohio, organized to manufacture printing equipment, particularly attachments for printing presses, has a few units now on trial and intends to place contracts for a larger number later. Several similar products also will be manufactured. J. H. Gilbert is one of the heads.

## Pittsburgh

PITTSBURGH, March 16.

THE first two months of the year have not been productive of many machine-tool orders for the local trade and this month to date has not developed any real improvement. Pending business is reasonably large and inquiries continue to filter in with an encouraging degree of regularity but it is upon hope rather than actual sales that cheerfulness is sustained. The Pittsburgh Railways Co. which last November put out a list containing about nine items is expected to place the order soon. The W. N. Kratzer Co., 3212 Smallman Street, Pittsburgh, has an inquiry out for a radial drill, a rotary planer and some punches and shears, the inquiry stating that quotations are wanted on good used or new equipment.

Tate, Jones & Co., Leetsdale, Pittsburgh, manufacturer of industrial furnace equipment, are contemplating the erection of an addition.

The Knox Bottle Co., Knox, Pa., is arranging for extensions in its plant, including the installation of a large furnace and accessory equipment to cost \$50,000. R. R. Underwood is general manager.

The Pittsburgh File & Steel Co., McDonald, Pa., W. S. Lockhart, head, is having plans drawn for a one-story factory, 45 x 355 ft., to cost approximately \$85,000 with equipment. Frank McC. Crooks, 541 Third Avenue, Pittsburgh, is architect.

The Sheehan Tire & Battery Service Co., Adams and Bedford Streets, Johnstown, Pa., is considering the erection of a three-story service, repair and garage building to cost \$60,000 with equipment. T. F. Sheehan is head.

The United States Engineer, Pittsburgh, will receive bids until March 30 for one steam boiler, circular 308.

The Monongahela West Penn Public Service Co., Fairmont, W. Va., is said to be arranging an expansion program to cost about \$1,000,000, including the erection of a new automatic power substation and other power station structures. J. D. Whittemore is vice-president.

The Board of Education, Fulton Building, Pittsburgh, has awarded a general contract to the Landane Brothers Contracting Co., 125 First Avenue, for a one-story machine and repair shop at Thirty-ninth and Butler Streets. George W. Gerwig is secretary.

The Board of Education of the Eagle District, Harrison County, Lumberport, W. Va., is planning the installation of manual training equipment in a proposed local high school

estimated to cost \$125,000, for which bids are being asked on a general contract until March 27. Stephen W. Ford, Latsetter Building, Clarksburg, W. Va., is architect.

The Ohio Valley Water Co., 523 Lincoln Avenue, Bellevue, Pa., will erect a new water-softening plant, 34 x 62 ft., including steel tanks, etc., estimated to cost \$80,000, at Neville Island. The J. N. Chester Engineers, Union Bank Building, Pittsburgh, are in charge.

The Gauley Power Co., Union Building, Charleston, W. Va., Arthur B. Koontz, secretary, has secured a permit from the Federal Power Commission for a hydro-electric power project on the Gauley and Meadow Rivers to develop a capacity of about 55,000 hp.

Ruhl & Watson, Mifflinburg, Pa., are contemplating the construction of a plant at Lewisburg, Pa., for the manufacture of sash, doors and other millwork products to cost \$70,000 with machinery.

The City Commission, Corry, Pa., has plans under way for a one-story brick repair shop, 30 x 60 ft., for city equipment. A grinder, small lathe and drill press will be required.

## Cincinnati

CINCINNATI, March 16.

A SLIGHT falling off in sales was noticeable in the local machine tool market the past week. Production schedules, however, are being maintained at the same level that has prevailed for several weeks and the present lull is looked upon as only temporary. The number of inquiries is encouraging and manufacturers believe that the next few months will show a gradual but steady increase in business. Lathe manufacturers state that production is holding up well and is running ahead of February. Milling machines are in fair demand with future prospects good. Planer manufacturers report good business.

The G. A. Gray Co. sold a 75-in. planer to the Harnischfeger Corporation, Milwaukee, the past week. The Liberty Machine Tool Co., Hamilton, Ohio, reported the sale of a 36-in. and a 48-in. planer to the Cleveland Frog & Switch Co., Cleveland, and a 36-in. planer to the Michie Printing Press & Mfg. Co., Chicago. Manufacturers of boring mills report fair sales and state that the first two weeks of March brought improved production and the first quarter of this year is ahead of the corresponding period in 1924. Radial and upright drills are in fair demand. Most drill manufacturers report a spotty market, but the volume of production is encouraging.

The Columbus, Newark & Zanesville Electric Co. has begun the erection of a power station in Zanesville to cost approximately \$40,000, including equipment. C. E. Moran is in charge of construction work.

The Kennedy Mfg. Co., Van Wert, Ohio, has awarded contract to the Indiana Engineering & Construction Co. for a one-story addition to cost \$60,000. It manufactures steel case equipment.

The Vogt Refrigerator Co., Louisville, Ky., will erect a plant at 616 Barret Street, to cost \$20,000.

The Reinhart Concrete Block Co., Fort Thomas, Ky., has been incorporated for \$10,000. It has just completed a one-story plant, 80 x 140 ft. For the present sales will be confined to local territory. Albert Reinhart is president.

The Wellston Clay Products Co., Wellston, Ohio, manufacturer of vitrified brick and clay products, is in the market for transmission, conveying and hoisting equipment, for a new plant nearing completion.

The city Council, Dover, Ohio, has authorized a fund of \$51,000, for extensions in the municipal electric light and power plant to double, approximately, the present capacity. A 750 kw. generating unit and accessory equipment will be installed.

L. E. Hunt, Bridgeport, Ohio, and associates, are considering the erection of a two-story and basement automobile service, repair and garage building to cost \$55,000.

The Chattanooga Implement & Mfg. Co., East Chattanooga, Tenn., manufacturer of agricultural implements, etc., is planning the erection of an addition, 80 x 350 ft., to cost \$100,000 with equipment. It is expected to provide facilities for about 200 operatives.

The Tennessee Electric Power Co., Hamilton National Bank Building, Chattanooga, Tenn., has acquired the local electric light and power plant at Smithville, Tenn., and plans extensions.

The Casey-Hedges Co., Whiteside Street, Chattanooga, Tenn., will proceed with foundations for a new power house. A number of plant buildings will be erected later.

J. Walter Moore, superintendent Unitile Co., Uhrichsville, Ohio, is said to be organizing a company to build a plant in the vicinity of Sheridan, Ohio, for the production of ornamental tile.

The Hunter Mining Co., Uniontown, Ky., care of W. L. Funkhouser, vice-president, Providence, Ky., recently organized, is considering the installation of machinery for local coal properties, to include electric power apparatus, mine cars, hoisting and other equipment.

The L. J. Breed Co., 824 James Building, Chattanooga, Tenn., machinery dealer, is in the market for a number of tank cars.

The Tennessee Machinery Exchange, P. O. Box 1094, Knoxville, Tenn., has inquiries out for two circular resaws, 24 to 30-in.; one hand-feed drum sander; and round head planer and matcher.

The Athens Plow Works, Inc., Athens, Tenn., will erect a new building, 55 x 140 ft., to cost \$40,000, for which a contract recently was let to O. W. Duggan, Athens.

The Globe Chemical Co., St. Bernard, Cincinnati, recently incorporated its business to facilitate increase in production. It will be in the market for acid apparatus and storage tanks, but will not make these purchases for several months. F. C. Grote is president.

## Detroit

DETROIT, March 16.

**P**LANs are being considered by the Morse Counterbore & Tool Co., 4135 Vermont Avenue, Detroit, for a one-story addition.

The Common Council, Iron River, Mich., is planning to purchase an electric-operated centrifugal pumping unit, capacity of 1500 gal. per min., for installation at the municipal waterworks.

The Peninsula & Northern Navigation Co., Muskegon, Mich., is said to be planning to purchase coal-loading and handling machinery.

The Amco Twist Drill & Tool Co., Detroit, is arranging to remove its plant to Kalamazoo, Mich., at the expiration of lease of present property. It is purposed to dispose of a stock issue of \$40,000, a portion of the proceeds to be used in connection with removal and proposed expansion at Kalamazoo.

The Paige Motor Car Co., Fort and McKinstry Streets, Detroit, has awarded contract to the Austin Co., 160 North La Salle Street, for a one-story addition to plant No. 2, 60 x 142 ft., to cost \$30,000.

The City Council, Watervliet, Mich., has negotiations under way for a water power site for a proposed municipal hydroelectric power plant to cost \$100,000 with machinery.

The Hill Diesel Engine Co., Lansing, Mich., recently organized, will take over the local plant and business of the Bates & Edmonds Co., manufacturer of gas engines. It will make improvements and concentrate production on oil marine and stationary engines; the manufacture of gasoline engines will be discontinued. The interests of James P. Edmonds, one of the founders of the original company, heretofore president and manager, have been taken over by R. E. Olds and Harry D. Hill. The first noted will be chairman of the board and Mr. Hill will be general manager. C. E. Ecker is president and John E. Orr, secretary and treasurer.

The Union Bag & Paper Co., Cheboygan, Mich., is said to have preliminary plans for rebuilding the portion of its finishing department destroyed by fire March 5, with loss estimated at \$30,000 including equipment.

The Board of Education, Lawrence, Mich., is considering the installation of manual training equipment in its two-story high and grade school to cost about \$100,000. A. H. Ellwood & Son, Haynes Building, Elkhart, Ind., are architects.

The Acme Stamping & Brass Works, Inc., Zeeland, Mich., recently organized, plans the operation of a local building for the manufacture of aluminum castings. A nickel plating works will also be established. John Glupker and Jacob A. Elenbaas, both of Zeeland, head the company.

The Morrison Metal Stamping Co., Jackson, Mich., is completing plans for a one-story addition to cost \$14,000.

The Fenton Machine Tool & Die Corporation, Fenton, Mich., is in the market for equipment for a one-story machine shop, under construction, at a cost of \$65,000. A. W. Westman is general manager.

The F. Joseph Lamb Co., 1938 Franklin Street, Detroit, is in the market for a large power punch press, preferably toggle; vertical slotter with at least 15-in. stroke; vertical boring mill with about 48-in. swing.

## St. Louis

ST. LOUIS, March 16.

**P**LANs are being prepared by the Burch Lead & Zinc Co., Joplin, Mo., for a new one-story mill and the installation of mining machinery, estimated to cost \$100,000.

George C. Newland, 29 South Eighteenth Street, Kansas City, Kan., and associates are arranging for the erection of a two-story and basement cold storage and refrigerating plant, to cost approximately \$100,000 with machinery. A department for ice-manufacture will also be installed. Hans Von Unwerth, Finance Building, Kansas City, Mo., is engineer.

Fire, March 8, destroyed a portion of the plant of the Fort Smith Cotton Oil Co., Fort Smith, Ark., with loss approximating \$200,000, including machinery. It is planned to rebuild. The plant of the Zenor Bottle Co. was also partially destroyed with loss of \$100,000, with equipment. The latter works will also be rebuilt.

The Arkansas Light & Power Co., Pine Bluff, Ark., has disposed of a preferred stock issue of \$672,000, a portion of the proceeds to be used for extensions. H. C. Couch is president.

The Tredway Boiler & Welding Works, Inc., P. O. Box 513, Blackwell, Okla., will erect a new one-story plant, 50 x 72 ft. C. H. Tredway is head.

The Brocksmith Mfg. Co., 1860 Menard Street, St. Louis, manufacturer of automobile equipment and accessories, will erect a one-story plant, 52 x 130 ft., to cost \$45,000, for which a general contract has been let to G. Moeller, 3520 Itaska Street.

The City Council, Idabel, Okla., plans the installation of an oil engine, motor-driven pumping equipment and accessory apparatus, in connection with a proposed waterworks estimated to cost \$23,000. V. V. Long & Co., Colcord Building, Oklahoma City, Okla., are engineers.

R. D. Brown, 341 Postal Station Building, Indianapolis, and associates are planning the erection of a two-story automobile service, repair and garage building at St. Louis, estimated to cost \$200,000 with equipment.

The Baum's Metal Specialties Co., 1022 Wyandotte Street, Kansas City, Mo., has acquired additional property and plans an extension, 35 x 40 ft. C. R. Baum is president.

The City Council, Boonville, Mo., is planning an early call for bids for two motor-driven, centrifugal pumps, and accessories.

The City Council, Steele, Mo., plans the installation of a pumping plant in connection with a proposed municipal waterworks, to cost approximately \$30,000. A. C. Moore, Industrial Building, Joplin, Mo., is consulting engineer.

Fire, March 2, destroyed a portion of the plant of the Barnsdall Refining Co., Barnsdall, Okla., with loss estimated at \$175,000, including machinery. It is planned to rebuild.

The Missouri Hydroelectric Power Co., care of Walter Cravens, Land Bank Building, Kansas City, Mo., president, has plans for the initial unit of a proposed hydroelectric generating station near Bagnell, Mo., to cost close to \$1,000,000 with machinery. The ultimate development will have a total output of 100,000 hp., estimated to cost more than \$7,000,000. The Burns & McDonnell Engineering Co., Interstate Building, Kansas City, Mo., is engineer.

## Indiana

INDIANAPOLIS, March 16.

**T**HE Board of Education, Indianapolis, plans the installation of manual training equipment in the proposed new high schools at Sheffield Avenue and Washington Street, and on West Street, near Eleventh Street, each three stories, estimated to cost \$500,000 and \$550,000 respectively. Vonnegut, Bohn & Miller, Indianapolis, are architects.

The Auto Parts Corporation, 725 Virginia Avenue, Indianapolis, has awarded contract to J. J. Reith, 550 North Temple Street for a one-story addition, 33 x 42 ft.

The Midland Utilities Co., South Bend, Ind., has arranged for a stock issue of \$12,000,000, a portion of the proceeds to be used for extensions and improvements in power plants and system.

The Board of School Trustees, Warren, Ind., is considering the installation of manual training equipment in the new two-story and basement high and grade school estimated to cost \$125,000, for which bids are being asked on a general contract until March 30. Griffith & Goodrich, 211 East Berry Street, Fort Wayne, Ind., are architects.

The City Council, Bloomington, Ind., is planning the installation of pumping equipment in connection with a pro-



posed municipal waterworks, for which a bond issue soon will be arranged.

The Ohio Valley Roofing Co., Evansville, Ind., has acquired property at Walker and Ohio Streets, and will erect a new plant in the fall. It will be three stories, 150 x 165 ft. A. J. Becker is secretary.

The Ivar Vliehe-Naess Co., 400 North Michigan Avenue, Chicago, architect, has plans for an automobile service, repair and garage building at Gary, Ind., to cost \$130,000 with equipment. Bids will be asked at once on a general contract.

The Central Mill & Lumber Co., 247 Calumet Street, Hammond, Ind., has awarded a general contract to the Bayless & Million Construction Co., Hammond, for two one-story additions, 100 x 100 ft. and 60 x 135 ft., to cost \$65,000. Mac Turner, Hohman Building, is architect. W. G. Paxton is president.

## South Atlantic States

BALTIMORE, March 16.

**T**HE Stauffer Electric Welding Co., 684 Pennsylvania Avenue, Hagerstown, Md., is contemplating rebuilding the portion of its plant destroyed by fire March 10 with loss of \$22,000.

Louis A. Tarr, 322 Sharp Street, Baltimore, machinery dealer, has inquiries out for vertical or locomotive type boilers of 40 to 80-hp. capacity.

The Purity Paper Vessels Co., 5 West Conway Street, Baltimore, manufacturer of paper boxes and containers, will equip the former textile mill of the Mount Vernon-Woodberry Mills, Woodberry, recently acquired, to double, approximately, its present output.

The Conner & Walters Co., 212 West Fourth Street, Charlotte, N. C., has awarded a general contract to the Deal & Wilkinson Construction Co., 209 South Church Street, for a one and two-story brick-manufacturing plant, with main building, 85 x 170 ft., to cost \$40,000. Louis Asbury, Realty Building, is architect.

The office of the chief of engineers, United States Army, Washington, will receive bids until April 2 for 7125 ft. of electric power cable, circular 22.

The Hackley Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for a locomotive crane, crawler type with traction wheels, 35-ft. boom, with  $\frac{1}{2}$  to  $\frac{3}{4}$  yd. clamshell bucket; riveting and calking air hammers, gyratory crushers, belt elevators, etc.; one 25-kva. dynamo belt-driven, 2300-volt, three-phase, 60-cycle.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until March 31 for one electric-operated fresh water pump for the Annapolis yard, schedule 3454; until March 24 for 8700 ft. steel pipe for the Hampton Roads yard, and 850 ft. steel pipe for Norfolk, schedule 3421; for 93,000 ft. open link chain for Charleston, S. C., and 685 ft. stud link chain for Key West, Fla., schedule 3462; for brass, bronze and copper for various yards, schedule 3405; 24,000 ft. wire rope for Puget Sound; 4200 ft. wire rope for Mare Island and 4200 ft. of steel wire rope, schedule 3424; 5000 ft. light and power wire, and 28,000 ft. telephone wire for Mare Island and 5000 ft. lighting wire for the Puget Sound yard, schedule 3426.

The Greenville Ice & Fuel Co., Cox Street, Greenville, S. C., is said to be planning the erection of a one-story ice-manufacturing plant. J. H. Armstrong is manager.

The Hanke Iron & Wire Works, 840 North Albany Avenue, Chicago, is said to be contemplating the establishment of a plant at Charleston, S. C., with removal of a portion of present works to this location.

Bids will be received by the Norfolk & Western Railway Co., Roanoke, Va., Clyde Cocke, purchasing agent, until March 25 for requirements for wire fencing from April 1 to June 30, contract serial No. AA-346; for requirements for wrought steel pipe, contract serial No. AA-350; steel springs, contract serial No. AA-349; couplers and parts, contract serial No. AA-345; and locomotive steel tires, contract serial AA-348.

The R. S. Armstrong & Brother Co., 676 Marietta Street, Atlanta, Ga., has inquiries out for a hydraulic wheel press, 150 to 200 tons capacity.

A. T. Klinksinger, Greenwood, S. C., and associates are contemplating the construction of an ice-manufacturing plant at Sparta, Ga., to cost \$35,000.

The Board of Aldermen, Franklin, N. C., is asking bids until March 27 for a municipal hydroelectric power plant development on the Little Tennessee River, near Leopard Bend, including power dam, etc. Robert & Co., Bona Allen Building, Atlanta, Ga., is engineer.

M. Whit Smith, Tifton, Ga., is in the market for machine shop and forge equipment.

The Otis Elevator Co., 218 West Franklin Street, Baltimore, has leased the six-story and basement building at 107-9 Light Street for a factory branch.

The Contracting & Engineering Co., P. O. Box 38, Atlanta, Ga., is interested in the purchase of ornamental iron, stairways, etc., and is asking for catalogs and information.

The Jacobs Auto Safety Lamp Co., Blacksburg, Va., has tentative plans for the establishment of a branch factory at Greeneville, Tenn. R. Frank Brown is president.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for a gasoline locomotive, 5 to 10 tons capacity; a 350 cu. ft. steam-driven air compressor, to operate at 100 lb. pressure; steel quarry dump cars, 3-yd. capacity, 36-in. gage; centrifugal pumps, capacity of 700 gal. per min.; six complete sets of frogs and switches for 30-lb. rails, and three sets for 60-lb. rail; one 300-hp. Corliss engine, and two 175 to 200-hp. boilers with complete accessories.

## Gulf States

BIRMINGHAM, March 16.

**A**RRANGEMENTS are being completed by the Texas & Pacific Railroad Co., Dallas, Tex., for a new engine house with repair facilities at Southeast Dallas, to be carried out in connection with a yard and terminal expansion program to cost close to \$1,500,000. James A. Somerville is vice-president in charge of operations.

The Southern Car & Foundry Co., Jackson, Tenn., has acquired the property of the Southern Motors Co., Houston, Tex., and is contemplating the construction of additions, including a one-story foundry and machine shop to cost approximately \$300,000 with equipment.

The El Paso Smelting Works, Inc., El Paso, Tex., is arranging for a one-story addition, 80 x 200 ft., and other extensions, estimated to cost \$200,000 with equipment. James Phipps, master mechanic and construction engineer, is in charge.

Fire, March 7, destroyed a portion of the shops and engine house of the Wichita Falls & Southern Railway Co., Wichita Falls, Tex., with loss estimated at \$50,000, exclusive of rolling stock. It is planned to rebuild.

The Birmingham Engine & Machinery Corporation, Birmingham, has inquiries out for a Corliss engine, 14 or 18 in., with accessories.

The United States Engineer, Jacksonville, Fla., will receive bids until March 25 for one horizontal duplex piston pump, circular 25.

The Rushton Corporation, 2124 Avenue D, Birmingham, will soon begin the construction of a new ice-manufacturing plant, with initial daily capacity of 1200 tons, estimated to cost \$100,000 with machinery. It will also erect an addition to its ice-making plant at Avenue E and Twenty-second Street, to cost approximately \$60,000. R. H. Woodrow is vice-president.

The Gray Tool Co., Harrisburg Boulevard, Houston, Tex., has plans for a one-story machine and forge shop, to cost \$35,000 with equipment. R. A. Mueller is general manager.

The Gulf, Colorado & Santa Fe Railway Co., Galveston, Tex., will erect additions to its shops at Cleburne, Tex., including a one-story machine shop, 120 x 240 ft., with wing, 70 x 150 ft., estimated to cost \$250,000 with equipment. It is purposed to begin work in May. P. Merritt is chief engineer.

The Royal Palm Ice & Refrigerating Co., 347 N. W. First Court, Miami, Fla., J. C. Pereno, president, will build a new ice-manufacturing and cold storage plant at Hialeah, Fla., estimated to cost \$230,000 with machinery. George H. Simmonite, 719 N. W. Thirteenth Avenue, is architect and engineer.

The Dallas Power & Light Co., Dallas, Tex., is completing plans for an addition in its steam-operated electric power house, to include the installation of a 20,000 kw. turbo-generator with accessory equipment. Extensions will also be made in other departments. The expansion is estimated to cost \$2,000,000. C. W. Davis is vice-president and general manager.

The Hollingsworth Motor Co., Houston, Tex., has construction under way on a one-story assembling works, 50 x 100 ft., with repair and parts department.

J. W. Billingsley, Interstate Bank Building, New Orleans, consulting engineer, has inquiries out for a 350-kw. engine-driven, electric generator unit, 480 volts, three phase, 60 cycle.

C. R. Simmons, Sweetwater, Tex., plans the construction of a power house at his proposed laundry at Corpus Christi, Tex., estimated to cost \$35,000. An automobile service, repair and garage building for motor trucks and cars is also planned.

The West Texas Electric Co., Sweetwater, Tex., will begin the construction of a new cold storage and refrigerating plant at Colorado, Tex. Plans are also under consideration for rebuilding an ice-manufacturing unit. The entire plant will cost approximately \$100,000 including equipment.

T. T. Wolfenden, 209 South Main Street, Longview, Tex., is in the market for a steam engine, Corliss type, 18 x 42 in., or 16 x 42 in., or slide valve, 10 x 14 in., with accessory apparatus.

## Pacific Coast

SAN FRANCISCO, March 11.

**F**RED L. DE SONNO, 1853 Thirty-eighth Avenue, Oakland, Cal., has awarded contract to M. E. Hopper & Sons, 1117 Webster Street, for a two-story foundry and machine shop, to cost \$25,000 with equipment.

The Imperial Valley Ice & Development Co., Holtville, Cal., is considering the construction of a new ice-manufacturing plant, reported to cost \$65,000 with equipment.

The Chicago Pneumatic Tool Co., Los Angeles, has awarded contract to the Wesco Construction Co., W. M. Garland Building, for a one-story addition to its plant on Santa Fe Avenue, 30 x 140 ft. Monaco & Bordeaux, Pershing Square Building, are architects.

A power house will be constructed by the Sanitary Laundry Co., 15 McCoppin Street, San Francisco, at its proposed addition, to cost about \$250,000 with machinery. B. Touhey, Pacific Engineers, Flatiron Building, is engineer.

The California-Oregon Power Co., 454 California Street, San Francisco, has arranged for a bond issue of \$2,000,000, a portion of the proceeds to be used for extensions.

Henry Pickard, Mutual Life Building, Seattle, is planning the construction of a lumber mill and box-manufacturing plant at Orting, Wash., to cost about \$50,000. The machinery will be electrically-operated.

The Big 4 Refining Co., Shelby, Mont., is completing plans for a new oil refinery with initial capacity of 1000 bbl. per day, to cost \$400,000 with machinery. J. B. Baker is in charge.

The Common Council, Tombstone, Ariz., will erect a municipal electric light, water and ice-manufacturing plant, for which plans are being prepared by Jules S. Vermeersch, Phoenix, Ariz., engineer.

The Washington Irrigation & Development Co., L. C. Smith Building, Seattle, Henry Pierce, representative, will proceed with a hydroelectric power development near Priest Rapids, Wash., to include the installation of a generating station, power dam and transmission system, with irrigation system for about 100,000 acres, to cost \$25,000,000.

The citizens of Riverside, Cal., have approved a bond issue of \$140,000, the proceeds to be used for the installation of a municipal hydroelectric generating plant. G. Morrison is city engineer, in charge.

Stanley M. Reinhardt, 2527 Virginia Road, Los Angeles, and associates, are considering the construction of a plant in the vicinity of San Jacinto, Cal., for the manufacture of coal by-products, to cost close to \$100,000 with machinery.

The Atlas Electric Supply Co., Los Angeles, has plans for a one-story manufacturing and repair works, 36 x 110 ft., at 766 Crocker Street. A. Godfrey Bailey, Hillstreet Building, is architect.

## Milwaukee

MILWAUKEE, March 16.

**C**ONSIDERABLE business is developing in the machine-tool market through metal-working concerns which need more room and have acquired existing factories from receivers or trustees. These shops usually are bare of equipment. Inquiry is better and sales somewhat less spotty.

The Waukesha Tool Corporation, Waukesha, Wis., has been organized by L. A. Thompson, John and Christian Griesell to manufacture tools, mechanical devices, machinery and specialties. The capital stock is \$60,000. Negotiations have been concluded for the acquisition of an existing building containing some equipment needed.

The Industrial Controller Co., Milwaukee, manufacturer of electric controlling devices, is preparing to effect a large increase in capacity. An idle factory has been purchased, the location of which is withheld temporarily, and the present equipment in the plant at 886-890 Greenbush Street will be transferred, being also supplemented with considerable new machinery. The Greenbush Street plant, with 22,200 sq. ft., is being offered for sale.

The Marshfield, Wis., Hardware & Auto Co. is letting

contracts this week for a new automotive sales and service building, 68 x 110 ft., part two stories and basement, designed by Gustave A. Krasin, local architect. Louis Grosser is secretary.

The Neenah, Wis., Board of Education has received tentative plans for the proposed new \$250,000 vocational training school from Childs & Smith, architects, Chicago, and intends shortly to call for construction bids. Equipment probably will not be purchased until late next summer, as the building will not be ready for use until Sept. 1.

The Kerner Incinerator Co., 1029 Chestnut Street, Milwaukee, will build a new manufacturing plant on East Water Street, 74 x 120 ft., two stories and basement, to cost about \$75,000. Contracts will be let at once and work started by April 1. It manufactures residence, apartment building and institution incinerators. Mackey Wells is president and general manager.

The Village Board, Cambria, Wis., is taking bids until March 31 for the construction and equipment of a municipal waterworks and sewerage system, designed by W. G. Kirchoff, consulting engineer, Madison, Wis. Two 300-gal. per min. motor and engine-driven centrifugal pumps, and a 50,000-gal. elevated steel tank are specified. W. C. Davies is secretary.

The Schmechel & Schubert Mfg. Co., Thiensville, Wis., has been organized with \$20,000 capital stock to manufacture agricultural machinery and implements. Castings will be made by outside foundries but the company is in the market for steel gears, chain, wheels, etc. Though its plant is sufficient for the present, it may be necessary later to enlarge or build a new one. Arno Schmechel is president; George Schubert, vice-president, and H. C. Schubert, secretary-treasurer.

## Canada

TORONTO, March 16.

**D**EMAND for machine tools in this territory is showing gradual improvement and more business is being booked than for some months past. Buyers, however, are chiefly interested in single tools for replacement, but the variety covers a wide field of industrial activity. Dealers are looking for some good sized lists on new works account within the next few weeks. Inquiries are increasing and are of the kind that usually turn into sales. Several inquiries are out for equipment for waterworks plants. A stronger demand is reported for electrical equipment and some improvement is also noted in sales of small tools.

Daniel Carter, 90 Lindsay Avenue, Toronto, is in the market for a screw cutting lathe, 6 to 10-in. swing; one drill, hand feed, 10-in. swing to drill ½-in. and a 20-in. disk grinder.

The Thermo Electric, Ltd., Brantford, Ont., has moved into large quarters and is installing additional equipment.

The Hamilton Gear & Machine Co., 62 Van Horne Street, Toronto, is in the market for a used Baker keyseater, No. 3 or 3½.

The Hoyt Metal Co. of Canada, Eastern Avenue, Toronto, has been incorporated with a capital stock of \$1,000,000. It is erecting a new plant for the manufacture of lead pipe, babbitt metal, etc.

The American Kardex Co., Tonawanda, N. Y., which recently purchased a 10-acre site at Chippewa, Ont., for the erection of a factory, proposes to start work early in the summer.

The St. Lawrence Furniture Co., Riviere Du Loup, Que., will make repairs and build addition to its factory and will require some new machinery.

The Toronto Electric Commission, Yonge Street, Toronto, is having plans prepared for a substation on Wiltshire Avenue. Equipment is still to be purchased.

The New Brunswick Electric Power Commission contemplates the erection of a steam power plant at Musquash, N. B., to cost \$350,000. E. A. Smith, Shediac, N. B., is chairman of the commission.

The City of Fredericton, N. B., contemplates the purchase of one 150-hp. oil burning engine and one 75-hp. motor to connect with centrifugal pump. G. C. McDowell is engineer.

Deagle Brothers, Erin, Ont., are having plans prepared for a water power development plant.

The town of Cardston, Alta., contemplates building a water power development plant at Belly River, at a cost of \$82,000, to supply power to towns in southern Alberta. C. B. Cheeseman is secretary of the light committee.



## Plans of New Companies

Porter & Ross, Inc., 30 Church Street, New York, recently incorporated with \$100,000 capital stock, takes over a business established three years as representative for manufacturers of street railroad and central station supplies. H. L. Ross and William Porter are the principals.

Oil Jack, Inc., New York, is completing experiments with a new automobile jack which, if present plans carry, will be manufactured later. Temporary address is in care of P. Crichton, 41 East Forty-second Street.

The Dualite Electric Lamp Corporation, 1170 Broadway, New York, has been incorporated with \$300,000 capital stock to manufacture electrical fixtures and specialties. It has a plant in full operation at St. Marys, Pa., and a warehouse at Emporium, Pa.

The Septic Tank Co., 250 West Fifty-seventh Street, New York, incorporated with \$20,000 capital stock, will manufacture as indicated, having plants in operation at Irondale and other points in Pennsylvania and Ohio.

Sanger-Turner, Inc., 1674 Broadway, New York, as a corporation will continue the business of a partnership operating as broker in structural iron work. It plans to establish a structural shop whenever a convenient location can be found. In the meantime it will continue along original lines. H. R. Sanger and E. S. Turner are the principals.

The Public Service Electric Refrigerating Corporation, lately organized, has changed its style to the Servel Corporation, which will manufacture a new type of machine for electrical refrigeration. Temporary address is in care of Smyth, Haggerty, King & Corcoran, 17 East Forty-second Street, New York.

The New England Boat Works, Mianus River Bridge, Riverside, Conn., has been incorporated to acquire the business of a boat construction works, similarly named and having an extensive plant for this kind of construction. Operations will continue under the same management.

Beers Thermostat, Inc., 10 Felix Street, Rochester, N. Y., recently incorporated, will take over the business of the Beers Thermostat & Electric Co., an outgrowth of the Beers Brothers Thermostat Co., organized in 1898. Improvements have been added to equipment and the line of products will be increased. Frederick C. Beers is president.

The Automatic Transmission Co., Sixth and Oak Streets, Portland, Ore., has been organized to manufacture automobile, truck and tractor transmission. Capital stock is \$1,000,000 and upon completion of organization matters it will erect a plant and install equipment for initial production. Products will be made of a high grade cold rolled steel. The company will not require materials before June. R. Farmer is president.

The Culbert Pipe & Fittings Co., 170-72 Eighth Street, Jersey City, N. J., recently incorporated with \$75,000 capital stock, has acquired the business of Arthur L. Perkins Co., founded 31 years ago. The new company will continue along the same lines, carrying warehouse stocks of pipe fittings, steam and plumbing supplies. It plans in the near future to take on a complete line of iron and steel products. I. E. Culbert is president and treasurer and E. W. Thompson, secretary.

The Newport Optical Mfg. Co., 100 Graham Avenue, Brooklyn, N. Y., recently incorporated with \$250,000 capital stock, takes over a plant now in operation and succeeds to a business established 20 years in the line indicated. E. I. Garvar is one of the principals.

The Clinton Yoke & Weaner Mfg. Co., Clinton, Okla., organized with \$25,000 capital stock, will manufacture fender braces, yokes and similar products, having a plant of its own where all operations will be conducted. C. G. Welch of the Welch Hardware Co., Clinton, is vice-president and manager.

The Halfey Engineering & Construction Co., Bluffton, Ind., has been incorporated as an engineering and construction company. Fred H. Wiecking is president; Everett I. Brown, vice-president; R. W. Halfey, secretary and general manager.

The Superior Oxy-Acetylene Machine Co., Hamilton, Ohio, has been incorporated for \$50,000. The company has been in business for the past 10 years manufacturing welding and cutting equipment and oxy-acetylene welding supplies. No change in the present management is contemplated. Officers of the company are C. E. Freeman,

president; O. E. Freeman, vice-president; and Ethyl P. Weller, secretary and treasurer.

The William Laidlaw Corporation, Belmont, N. Y., has been organized with the intention of purchasing a machine shop and conducting operations in this field. Plans are still indefinite. E. V. Champlin is corporate representative.

The Wilson Art Metal Co., Lansing, Mich., has been organized as a selling organization for automobile hardware and similar merchandise. J. W. Wilford is president.

The C. L. Rockwell Mfg. Co., 1628-30 Washington Avenue, Alton, Ill., recently incorporated, is manufacturing a device to dim automobile headlights. At present parts are made outside and it does assembling only. Officers are Robert H. Streeper, president; Calvin N. Streeper, vice-president; William F. Loelke, treasurer; E. B. McDaniel, secretary, and C. L. Rockwell, manager.

The Anchor Mfg. Co., 2131 South Turner Avenue, Chicago, incorporated with \$10,000 capital stock, has leased a plant with 7000 sq. ft. of floor space and has purchased equipment to manufacture concrete mixers, hoppers, cars and special plate work. Officers are Joseph F. Kacena, president and treasurer; Jerome Kacena, vice-president, and Frank Bouzek, secretary.

The Federal Radiator & Boiler Co., 1351 West Thirty-Seventh Place, Chicago, recently incorporated with \$250,000 capital stock, has taken over the business of the Kellogg-Mackay Co. Officers are C. V. Kellogg, president; T. F. Schlade, vice-president; F. W. Fix, treasurer; J. D. McGuire, secretary.

The Lincoln-Schlueter Machinery Co., 225-227 West Illinois Street, Chicago, recently incorporated with \$20,000 capital stock, is an incorporation of M. L. Schlueter Co., organized in 1902. The company will continue to manufacture the Schlueter floor surfacer and also will make a twin disk, all-purpose floor machine. Factory equipment, although sufficient for present requirements, is expected to become inadequate and additional lathes, drill presses, screw machines, and milling machines are expected to be needed later. Officers are M. L. Schlueter, president; F. E. Wadhams, vice-president and secretary; H. G. Deja, treasurer.

The Huron Forge & Machine Co., Detroit, has been organized with capitalization of \$150,000 to manufacture forgings and iron and steel products. Equipment will consist of forge drop hammers with facilities for turning out about 500,000 small drop forgings a month and with machine facilities for furnishing finished products. It has a plant now under construction which will be finished about April 1. Emil G. Westover, who has had 15 years of drop forge experience, is general manager of the new plant. J. B. Webb of the Jervis B. Webb Co., 7444 Woodward Avenue, Detroit, is president.

The recently organized National Association of Dairy Machinery Manufacturers has been superseded by the American Dairy Machinery & Supply Association, the secretary of which is A. H. Barber, 306 West Austin Avenue, Chicago.

The Gurney Sheet Metal Works, 715 East Fourth Street, Long Beach, Cal., has been organized to operate a general sheet metal works in the building line. Charles L. Gurney heads the company.

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# Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

## Bars, Shapes and Plates

Per Lb.

Bars:	
Refined iron bars, base price.....	3.24c.
Swedish charcoal iron bars, base.....	7.00c. to 7.25c.
Soft steel bars, base price.....	3.24c.
Hoops, base price.....	4.49c.
Bands, base price.....	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base.....	3.34c.
Channels, angles and tees under 3 in. x ¼ in., base.....	3.24c.
Steel plates, ¼ in. and heavier.....	3.34c.

## Merchant Steel

Per Lb.

Tire, 1½ x ½ in. and larger.....	3.30c.
(Smooth finish, 1 to 2½ x ¼ in. and larger).....	3.65c.
Toe-calk, ½ x ¾ in. and larger.....	4.20c.
Cold-rolled strip, soft and quarter hard.....	7.00c.
Open-hearth spring steel.....	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds.....	4.15c.
Squares, flats and hex.....	4.65c.
Standard tool steel, base price.....	15.00c.
Extra tool steel.....	18.00c.
Special tool steel.....	23.00c.
High-speed steel, 18 per cent tungsten.....	70c.

## Sheets

### Blue Annealed

Per Lb.

No. 10.....	3.89c.
No. 12.....	3.94c.
No. 14.....	3.99c.
No. 16.....	4.09c.

### Box Annealed—Black

Soft Steel  
C. R. One Pass  
Per Lb.

Blued Stove  
Pipe Sheet  
Per Lb.

Nos. 18 to 20.....	4.45c. to 4.60c.	.....
Nos. 22 and 24.....	4.60c. to 4.75c.	5.25c.
No. 26.....	4.65c. to 4.80c.	5.30c.
No. 28*.....	4.75c. to 4.90c.	5.40c.
No. 30.....	4.85c. to 5.10c.	.....

### Galvanized

Per Lb.

No. 14.....	4.85c. to 5.00c.
No. 16.....	5.00c. to 5.15c.
Nos. 18 and 20.....	5.15c. to 5.30c.
Nos. 22 and 24.....	5.30c. to 5.45c.
No. 26.....	5.45c. to 5.60c.
No. 28*.....	5.75c. to 5.90c.
No. 30.....	6.25c. to 6.40c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

## Welded Pipe

### Standard Weld

Black Galv.

### Wrought Iron

Black Galv.

½ in. Butt... 46 29	½ in. Butt.. 4 +19
¾ in. Butt... 51 37	¾ in. Butt.. 11 + 9
1-3 in. Butt.. 53 39	1-1½ in. Butt 14 + 6
2½-6 in. Lap 48 35	2-in. Lap ... 5 +14
7 & 8 in. Lap 44 17	3-6 in. Lap.. 11 + 6
11&12 in. Lap 37 12	7-12 in. Lap. 3 +16

## Bolts and Screws

Machine bolts, cut thread, 40 and 10 per cent off list  
Carriage bolts, cut thread, 30 and 10 per cent off list  
Coach screws, 40 and 10 per cent off list  
Wood screws, flat head iron,  
72½, 25, 10 and 5 per cent off list

## Steel Wire

BASE PRICE\* ON NO. 9 GAGE AND COARSER

Per Lb.

Bright, basic.....	4.25c. to 4.50c.
Annealed soft.....	4.50c. to 4.75c.
Galvanized annealed.....	5.15c. to 5.40c.
Coppered basic.....	5.15c. to 5.40c.
Tinned soft Bessemer.....	6.15c. to 6.40c.

\*Regular extras for lighter gage.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general headings of "Iron and Steel Markets" and "Non-Ferrous Metals."

## Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet.....	19½c. to 20½c.
High brass wire.....	19½c. to 20½c.
Brass rods.....	17½c. to 18½c.
Brass tube, brazed.....	27½c. to 28½c.
Brass tube, seamless.....	23½c. to 24½c.
Copper tube, seamless.....	24½c. to 25½c.

## Copper Sheets

Sheet copper, hot rolled, 22½c. to 23½c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

## Tin Plates

Bright Tin	Grade	Grade	Coke—14 x 20	Prime	Seconds
	"AAA"	"A"	80 lb...	\$6.15	\$5.90
	Charcoal	Charcoal	90 lb...	6.30	6.05
	14x20	14x20	100 lb...	6.45	6.20
IC..	\$11.25	\$8.85	IC..	6.65	6.40
IX..	12.85	10.85	IX..	7.85	7.60
IXX..	14.40	12.55	IXX..	9.00	8.75
IXXX..	15.75	13.85	IXXX..	10.35	10.10
IXXXX..	17.00	15.05	IXXXX..	11.35	11.10

## Terne Plates

8 lb. coating, 14 x 20

100 lb. ....	\$7.00 to \$8.00
IC .....	7.25 to 8.25
IX .....	8.25 to 8.75
Fire door stock.....	9.00 to 10.00

## Tin

Straits, pig.....	58c.
Bar.....	64c. to 66c.

## Copper

Lake ingot.....	16½c.
Electrolytic.....	16½c.
Casting.....	16 c.

## Spelter and Sheet Zinc

Western spelter.....	9½c.
Sheet zinc, No. 9 base, casks.....	12c. open 12½c.

## Lead and Solder\*

American pig lead.....	10¼c. to 10½c.
Bar lead.....	13c.
Solder, ½ and ⅓ guaranteed.....	40c.
No. 1 solder.....	37c.
Refined solder.....	30½c.

\*Prices of solder indicated by private brand vary according to composition.

## Babbitt Metal

Best grade, per lb.....	75c. to 90c.
Commercial grade, per lb.....	35c. to 50c.
Grade D, per lb.....	25c. to 35c.

## Antimony

Asiatic.....	22c. to 23c.
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## Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.....	36c.
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## Old Metals

The market is unsettled again and business is quiet. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible.....	12.00
Copper, heavy wire.....	11.50
Copper, light bottoms.....	9.75
Brass, heavy.....	7.25
Brass, light.....	6.00
Heavy machine composition.....	8.75
No. 1 yellow brass turnings.....	8.50
No. 1 red brass or composition turnings.....	8.50
Lead, heavy.....	7.00
Lead, tea.....	5.50
Zinc.....	4.25
Cast aluminum.....	17.00
Sheet aluminum.....	17.00